

LCD-Monitor

Chassis : LTW22HS / LTW22GS
LTW20HS / LTW20GS

Model : T220 / T220G
T220N / T220GN
T200 / T200G
T200N / T200GN

SERVICE Manual

TFT-LCD Monitor



T220 / T220G / T220N / T220GN
T200 / T200G / T200N / T200GN

Contens

Refer to the service manual in the GSPN (see the rear cover) for the more information.

Contents



GSPN (Global Service Partner Network)

Area	Web Site
North America	http://service.samsungportal.com
Latin America	http://latin.samsungportal.com
CIS	http://cis.samsungportal.com
Europe	http://europe.samsungportal.com
China	http://china.samsungportal.com
Asia	http://asia.samsungportal.com
Mideast & Africa	http://mea.samsungportal.com

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1. Precautions

1-1. Safety Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1-1. Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power and DC power jack before servicing.

1-1-2. Servicing the LCD Monitor

1. When servicing the LCD Monitor, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistorcapacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):
   WARNING : Do not use an isolation transformer during this test.
   Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

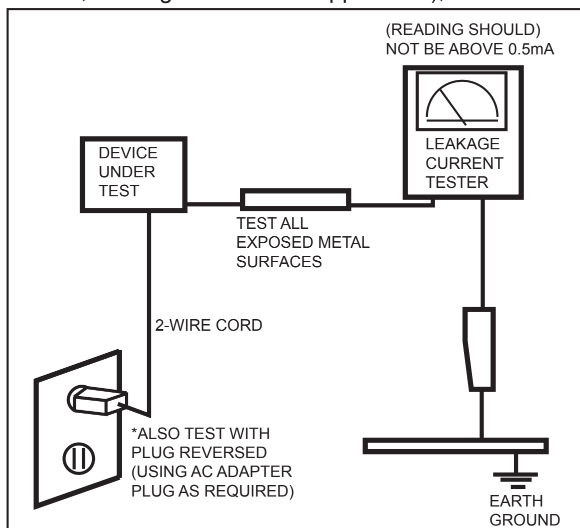


Figure 1-1. Leakage Current Test Circuit

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts.
   The current measured should not exceed 0.5 milliamp.
   Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4. Product Safety Notices

Some electrical and mechanical parts have special safetyrelated characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2. Servicing Precautions

WARNING: An electrolytic capacitor installed with the wrong polarity might explode.
Caution: Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.
Note: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to theblades of the AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3. Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   Caution: Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4. Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.
2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (10cm) between the product and the wall for ventilation purposes.
   A rise in temperature within the product may cause fire.

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2. Product specifications

2-1. Feature & Specifications

Model	T220 / T220G / T200N / T220GN T200 / T200G / T200N / T200GN
Feature	

- ▶ Panel Specifications: 300cd/m2, 2ms, CR 1000:1(DC), 170/160(CR>10)
- ▶ DPMS : <1W
- ▶ Magic Bright3, Magic Tune, Windows Vista authentication
- ▶ DC 20,000: 1 applied
- ▶ Supports fixed vertical and horizontal ratios
- ▶ Supports camera effect mode: Black and white/Sepia/Aqua/Green

Specifications		
Item	**Description**	
Model	**T220 / T220G / T200N / T220GN**	**T200 / T200G / T200N / T200GN**
LCD Panel	TFT-LCD panel, RGB vertical stripe, normally white transmissive,	
	22”wide Viewable 0.258(H) mm x 0.258(V) mm pixel pitch	20”wide Viewable 0.258(H) mm x 0.258(V) mm pixel pitch
Scanning Frequency	Horizontal : 30 kHz ~ 81 kHz (Automatic) Vertical: 56 Hz ~ 75 Hz(WSXGA+ : 60Hz)	
Display Colors	16.7 Million colors	
Maximum resolution	Horizontal: 1680 Pixels Vertical: 1050 Pixels	
Input Signal	22” Dual	20” Dual
Input Sync Signal	Seperate H/V sync, Composite H/V, Sync-on-Green Level: TTL level	
Maximum Pixel Clock rate	135 Mhz	
Active Display (Horizontal/Vertical)	473.76(H) x 296.1(V)	
AC power voltage & Frequency	AC 110V~130V, 60Hz & AC, 200V~240V 50Hz	
Power Consumption	45 W	40W
Dimensions Set (W x D x H)	520 x 215 x 442 mm	486 x 215 x 422 mm
Weight (Set/Package)	Set : 5.8kg, Package : 7.5Kg (With Stand)	Set : 5.4kg, Package : 7.0Kg (With Stand)
Environmental Considerations	Operating Temperature: 10˚C ~ 50˚C(50˚F ~ 122˚F) Operating Humidity : 10% ~ 90% Operating Temperature: -20˚C ~ 45˚C(-4˚F ~ 113˚F) Operating Humidity: 5% ~ 90%	
Note: Designs and specifications are subject to change without prior notice.		

2-2. Spec Comparison to the Old Models

Model	T220 / T220G / T200N / T220GN T200 / T200G / T200N / T200GN	Mckinley(943BW)
Design		
Resolution	1680 x 1050	1440 x 900
Input	T220, T220G, T200, T200G : Analog / DVI Digital T220N, T220GN, T200N, T200GN : Analog	Analog / Digital with HDCP
Response Time	2ms	5ms(W to B)
Viewing Angle	170/160(CR>10)	170/160(CR>10)
Brightness	300cd/m²	300cd/m²
Contrast	20,000:1(DC)	1000:1
MagicBright	7 step	7 step
Feature	Magic Color Color Effect Image Size Magic Bright3 Magic Tune (Premium)	Magic Color Color Effect Image Size Magic Bright3 Magic Tune (Premium)

*Color Effect
- Grey scale: Images are displayed in a grey tone on the screen.
- Green: Images are displayed in a green tone on the screen.
- Aqua: Images are displayed in a blue tone on the screen.
- Sepia: Images are displayed in a brown tone on the screen.

Image Size : If the resolution is not wide resolution, this option allows the screen size to be selected as normal or wide.

2-3. Accessories

Product	Description	Ccde. No	Remark
	Quick Setup Guide	BH68-00907A	Samsung Electronics Service center
	Warranty Card (Not available in all locations)	BH68-00633B	
	User's Guide, Monitor Driver, Natural Color Pro Software	BN59-00716A	
	D-Sub(15 Pin) Cable	BN39-00244G	
	Power Cord	3903-000042	

2-4. Accessories (Sold separately)

Product	Description	Ccde. No	Remark
	DVI Cable	BN39-00246L	Samsung Electronics Service center

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3. Disassembly and Assembly

This section describes the disassembly and reassembly sequences for this monitor.

⚠ Warning: As this monitor has parts that are sensitive to static electricity, be careful when handling them.

3-1. Disassembly

⚠ Caution:
1. Turn the monitor off before beginning the disassembly process.
2. When disassembling the monitor, do not use any metal tools except for the provided jig.
3. Disassemble the monitor carefully as directed in the following procedures.

Description	Photo	Screws
1. Place a soft cloth on the table and place the monitor onto it with the front part facing downwards. Hold the monitor set with one hand and hold and pull the stand body backwards with the other hand to remove the stand body from the monitor set. 2. Insert both hands into the groove and then lift up and remove the cover.		
3. Remove the four (2) screws.		

Description	Photo	Screws
4. Remove the cover and the LCD panel using the provided jig on both grooves at the bottom.		
5. Remove the INVERTER wire, LVDS cable, and FUNCTION cable, and then remove the SHIELD-COVER.		

Description	Photo	Screws
6. After disconnecting SHIELD-LAMP of left side, disassemble lamp wire between panel and IP Board.		
7. Remove the four (4) screws shown in the figure and remove the Bracket support.		
8. Remove the two (2) screws and then remove the holders from the four (4) snaps designated in the right figure using the provided jig.		

Description	Photo	Screws
9. Remove the connectors. ⚠ Caution : Servicing is not supported for the PCB.		
▶Assembly 10. The assembly is in the reverse order of the disassembly. 11. Connect the disassembled snap and the LED module again.		
12 . Fix the connecting wire with filament tape ⚠ Caution : If the wire is damaged when closing the cover, an operating error may occur. Therefore, make sure to close the cover after fixing it with filament tape.	filament tape	

Description	Photo	Screws
13. The assembly is in the reverse order of the disassembly. Insert the cover into the groove and then press both sides.		

※The assembly is in the reverse order of disassembly.

Memo

4. Troubleshooting

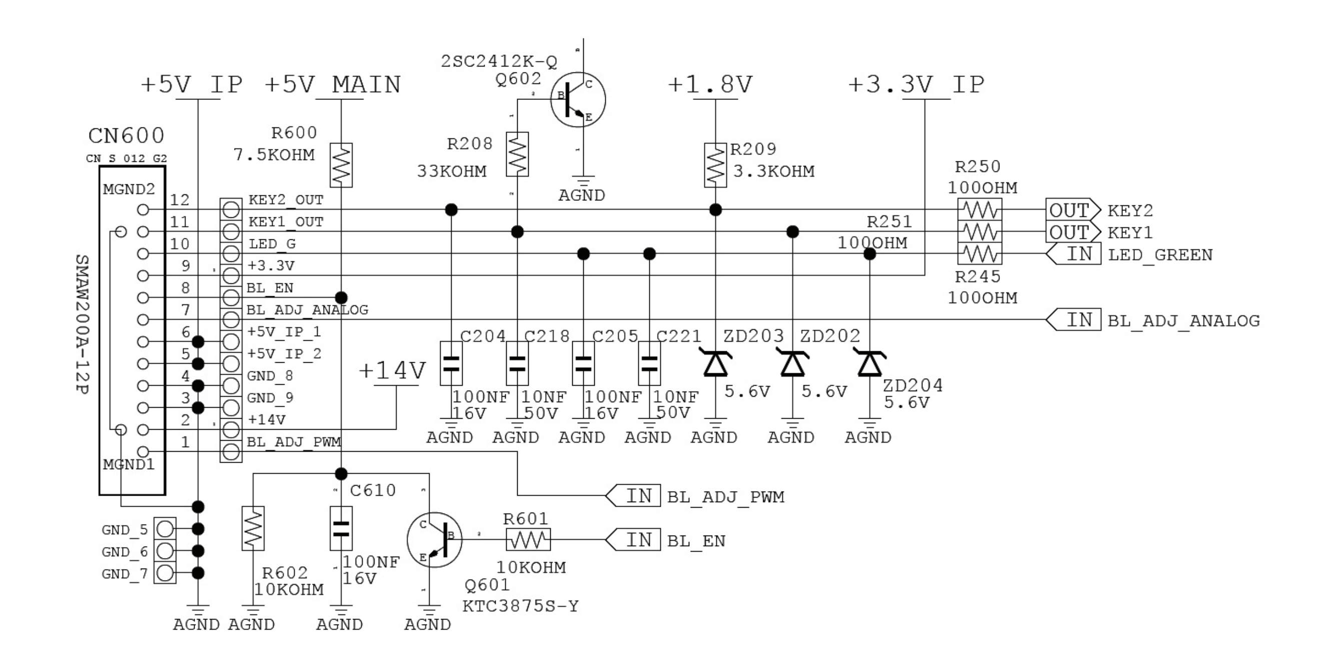
4-1. Troubleshooting

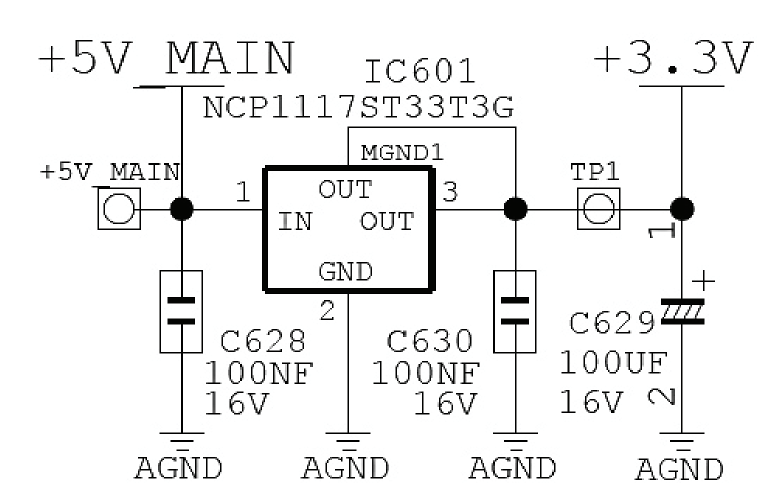
1. Set custom mode as follows before beginning a repair.
   • Resolution: 1680 x 1050
   • H-frequency: 60 kHz
   • V-frequency: 65 Hz
2. If the screen is blank, check whether the power cord is connected correctly.
3. The circuits to check:
   • When the raster does not appear: The Function PCB, Main PCB, I/P PBA
   • When 5V is generated but a blank screen is displayed: Main PCB
   • When 5V is not generated: I/P PBA
4. "Press the MENU button and hold down the, "↵ (Enter, Source)" button for more than five (5) seconds to return the monitor to factory mode.

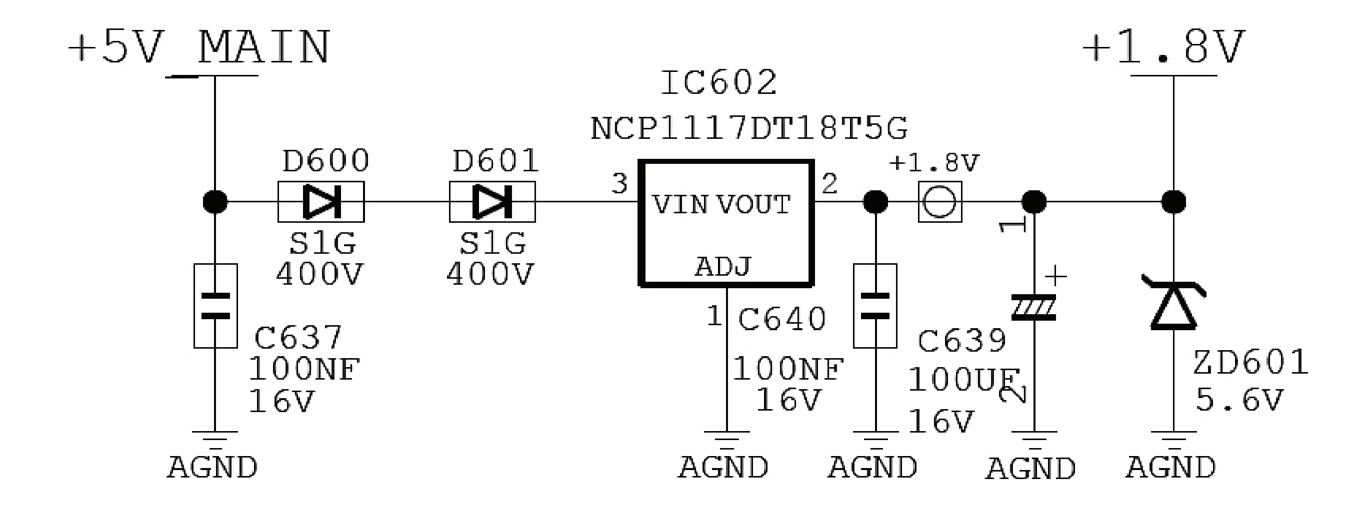
4-2. When the Power Does Not Turn On

Symptom	- When turning on the Power button after connecting the power cable, the LED at the front of the monitor does not operate.
Major checkpoints	- When turning on the Power button after connecting the power cable, the LED at the front of the monitor does not operate. - Check the IP board power fuse and the IP board output power. - Check the connections for the IP board and the Main board inside the monitor. - Check the Main board power part and also check whether there is any abnormal output at any of the other output terminals.
	CN 600 IC 602 IC 601
Diagnostics	Is DC 5V measured at pins 5, 6 of the CN600 connector when pins 3, 4 are 0V? → No: Replace the IP board. → Yes: IIs DC 3.3V measured at pin 3 of IC601 when pin 1 is DC 5V? → No: Check the circuits related to IC601. → Yes: Is DC 1.8V measured at pin 2 of IC602 when pin 3 is DC 5V? → No: Check the circuits related to IC602. → Yes: Check and replace the IP board. Check the connection status for the function assy. → Yes: return to "Is DC 5V measured at pins 5, 6 of the CN600 connector when pins 3, 4 are 0V?"
Caution	Make sure to disconnect the power before working on the IP board.

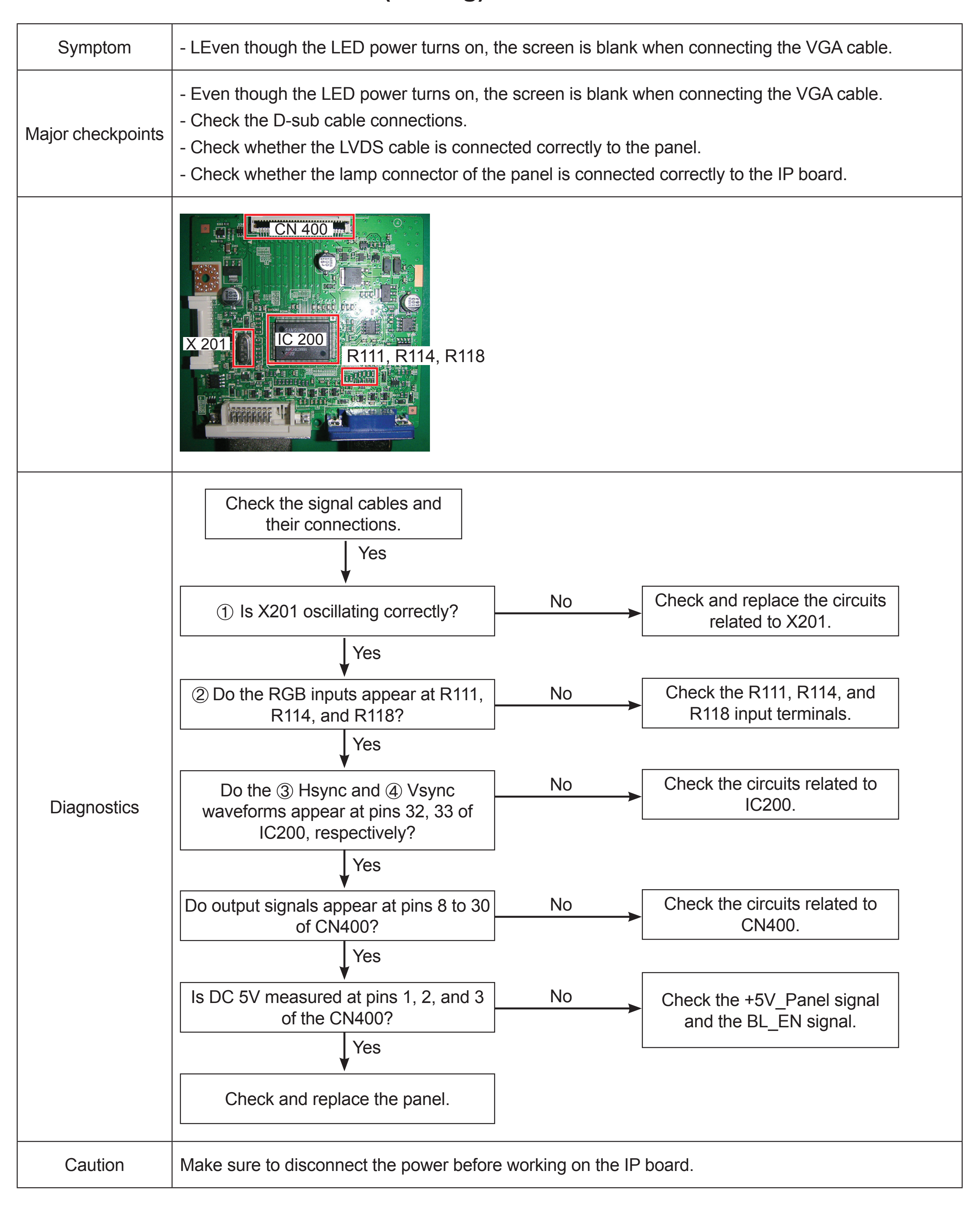
4-2-1. Circuit diagrams when the power does not turn on





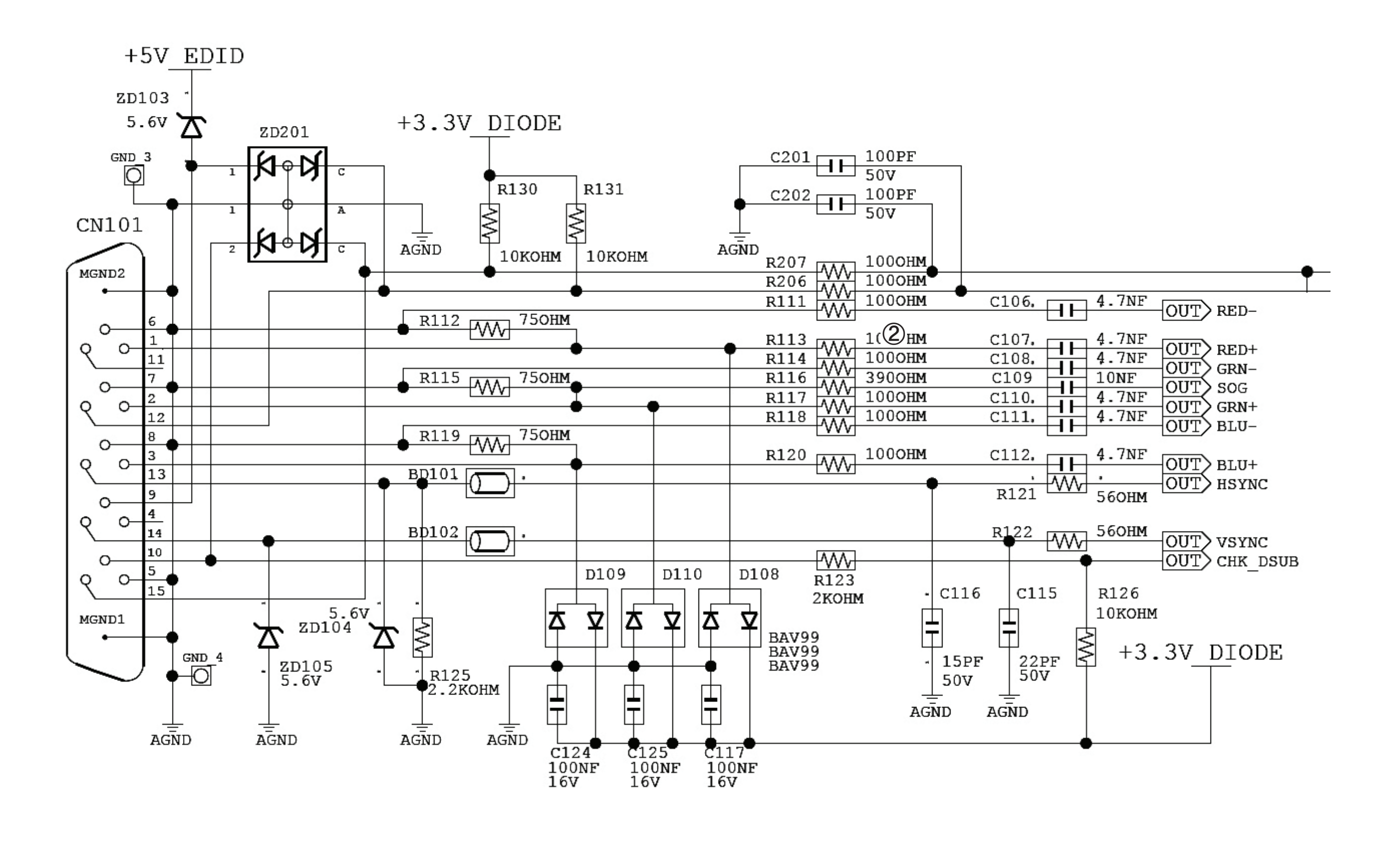


4-3. When the screen is blank (Analog)



Symptom	- LEven though the LED power turns on, the screen is blank when connecting the VGA cable.
Major checkpoints	- Even though the LED power turns on, the screen is blank when connecting the VGA cable. - Check the D-sub cable connections. - Check whether the LVDS cable is connected correctly to the panel. - Check whether the lamp connector of the panel is connected correctly to the IP board.
	CN 400 X 201 IC 200 R111, R114, R118
Diagnostics	Check the signal cables and their connections. ↓ Yes ① Is X201 oscillating correctly? → No → Check and replace the circuits related to X201. ↓ Yes ② Do the RGB inputs appear at R111, R114, and R118? → No → Check the R111, R114, and R118 input terminals. ↓ Yes Do the ③ Hsync and ④ Vsync waveforms appear at pins 32, 33 of IC200, respectively? → No → Check the circuits related to IC200. ↓ Yes Do output signals appear at pins 8 to 30 of CN400? → No → Check the circuits related to CN400. ↓ Yes Is DC 5V measured at pins 1, 2, and 3 of the CN400? → No → Check the +5V_Panel signal and the BL_EN signal. ↓ Yes Check and replace the panel.
Caution	Make sure to disconnect the power before working on the IP board.

4-3-1. When a blank screen is displayed (Analog)



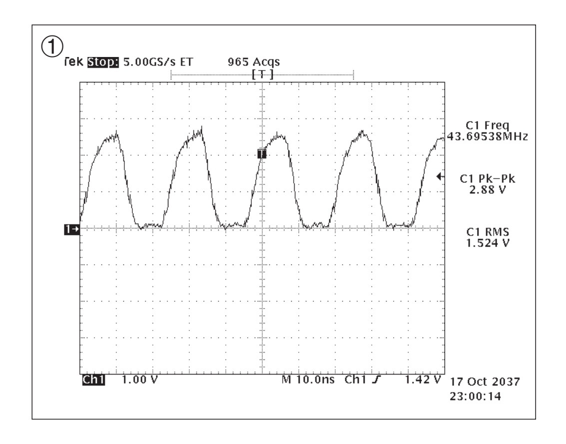
+5V_EDID
R216
100OHM
R215
10KOHM
Q201
KSC1623-Y
OUT
OTECT
BL_EN OUT
R273
10OHM
X201
14.31818MHZ
R232
100OHM
①
C211
22PF
50V
C210
22PF
50V
AGND
R234
4.7KOHM
DDC_SDA_DVI IN
DDC_SCL_DVI IN
+3.3V
VDVI
R235
390OHM
RX2+ IN
RX2- IN
RX1+ IN
RX1- IN
RX0+ IN
RX0- IN
RXC+ IN
RXC- IN
AVDC3.3
BLU- IN
BLU+ IN
GRN- IN
GRN+ IN
SOG IN
RED- IN
RED+ IN
C213
100NF
16V
C228
1UF
10V
C229
100PF 50V
③
④
HSYNC IN
VSYNC IN
DDC_SDA_VGA IN
DDC_SCL_VGA IN
LED_GREEN OUT

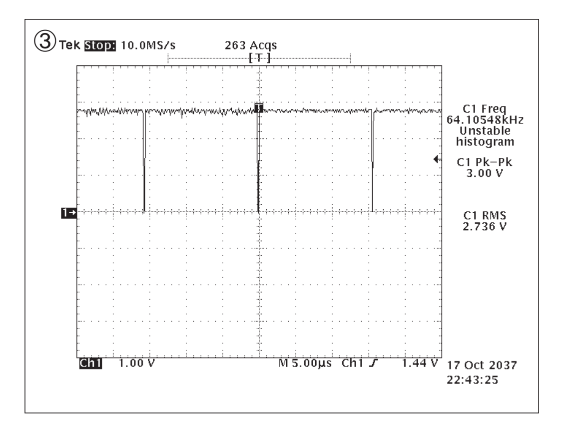
128 127 126 125 124 123 122 121 120 119
XIN XOUT VDDC GPIO_P13/PWM2 GPIO_P07 GPIO_P06 GPIO_P03/SAR3 GPIO_P02/SAR2 GPIO_P01/SAR1 GPIO_P00/SAR0

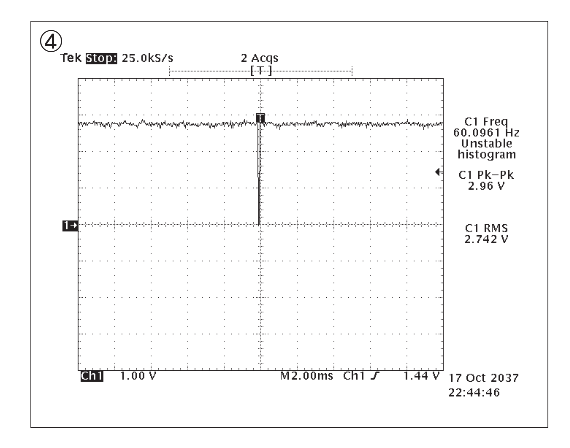
1 GND
2 GPIO_P14/PWM0
3 GPIO_P15
4 GPIO_P16
5 DDCD_SDA
6 DDCD_SCL
7 REXT
8 AVDD_33
9 RX2P
10 RX2N
11 GND
12 RX1P
13 RX1N
14 AVDD_33
15 RX0P
16 RX0N
17 GND
18 RXCKP
19 RXCKN
20 AVDD_33
21 AVDD_18
22 BIN0M
23 BIN0P
24 GIN0M
25 GIN0P
26 SOGIN0
27 RIN0M
28 RIN0P
29 GND
30 REFM
31 REFP
32 HSYNC0
33 VSYNC0
34 DDCA_SDA/RS232_TX
35 DDCA_SCL/RS232_RX
36 GPIO_P22/PWM1

+5V_PANEL
CN400
R236
10KOHM
+5V_PANEL
AGND
C231
100NF
16V
MGND1
MGND2
LVA3P IN LVA3P
LVA3M IN LVA3M
LVACKP IN LVACKP
LVACKM IN LVACKM
LVA2P IN LVA2P
LVA2M IN LVA2M
LVA1P IN LVA1P
LVA1M IN LVA1M
LVA0P IN LVA0P
LVA0M IN LVA0M
LVB3P IN LVB3P
LVB3M IN LVB3M
LVBCKP IN LVBCKP
LVBCKM IN LVBCKM
LVB2P IN LVB2P
LVB2M IN LVB2M
LVB1P IN LVB1P
LVB1M IN LVB1M
LVB0P IN LVB0P
LVB0M IN LVB0M
AGND

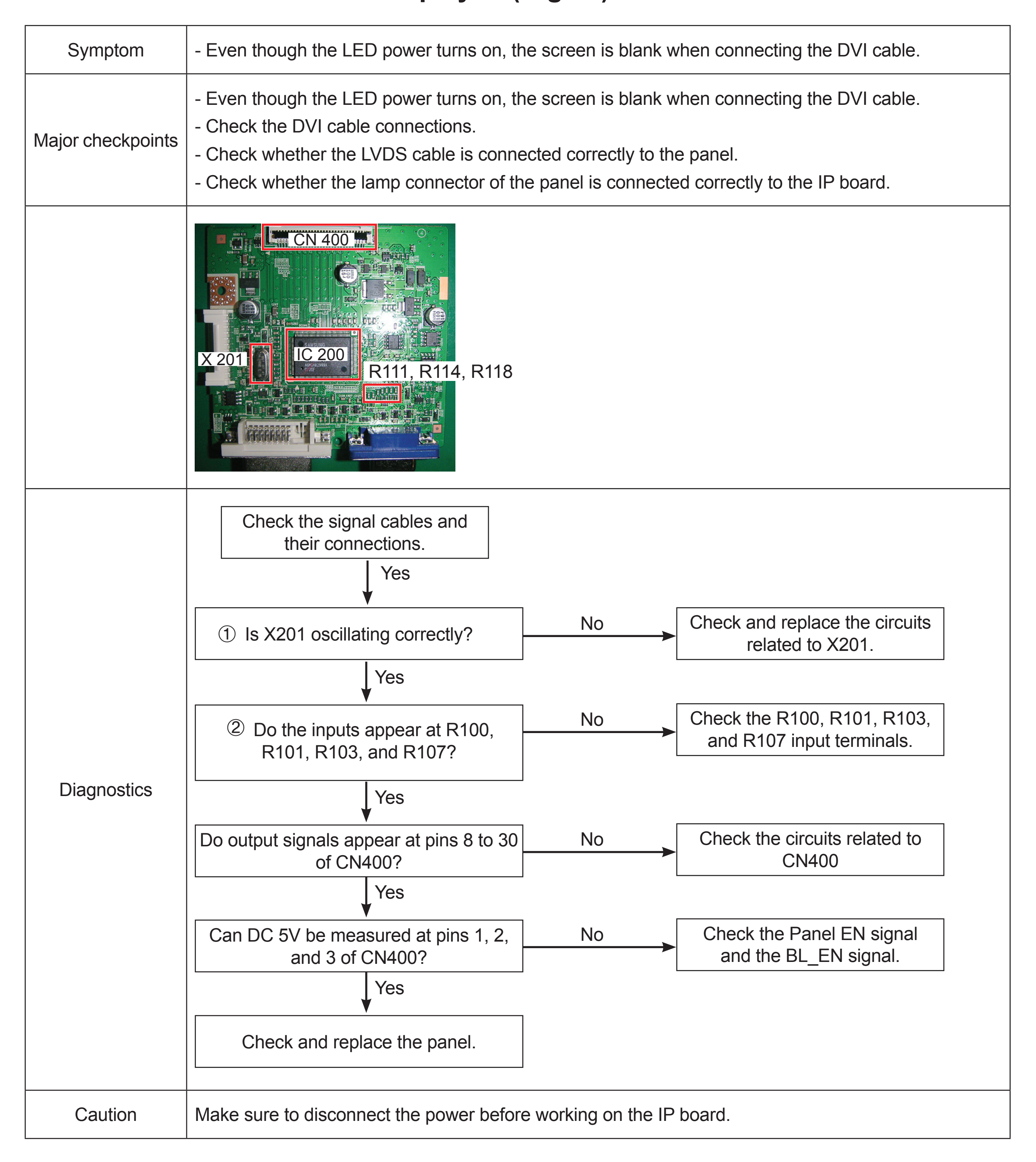
4-3-2. Waveforms when no screen is displayed (Analog)



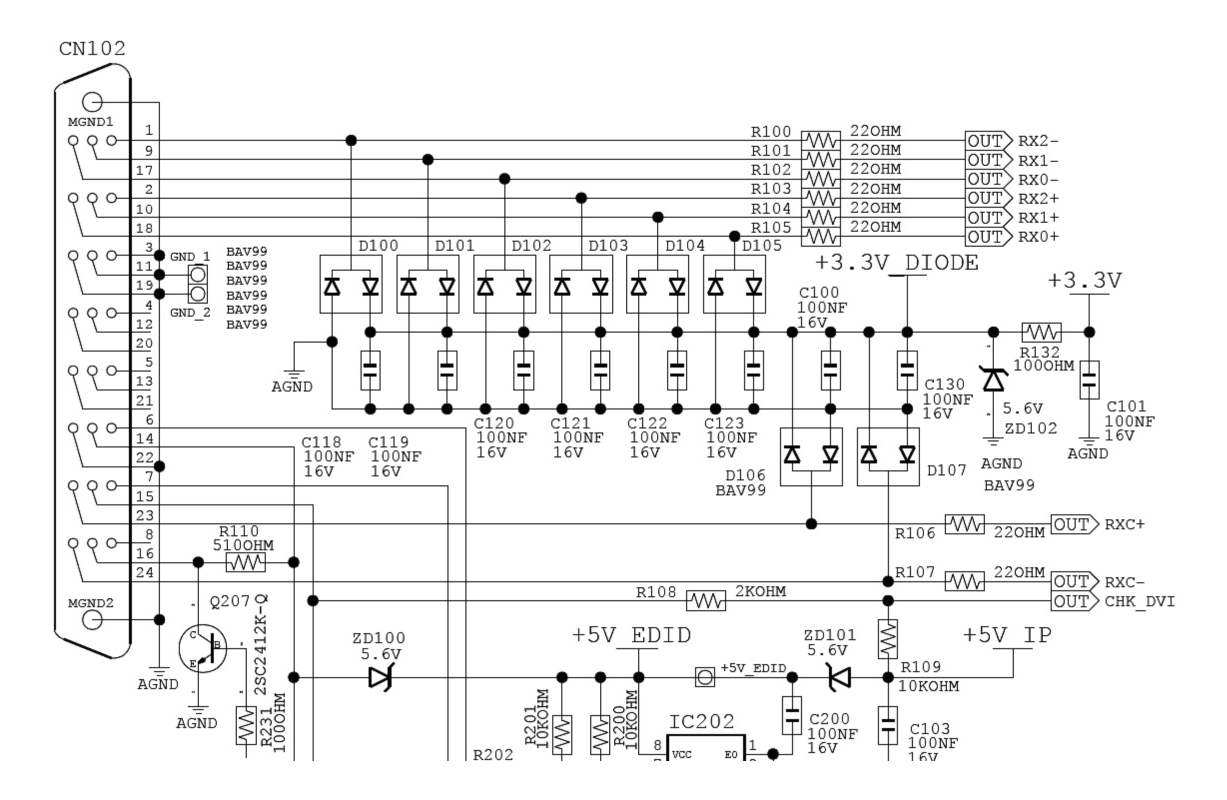


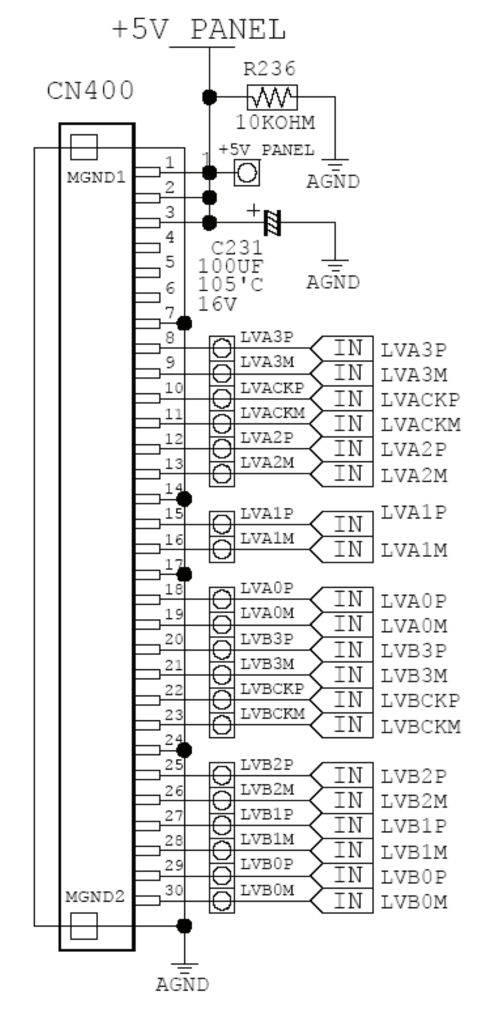


4-4. When a blank screen is displayed (Digital)

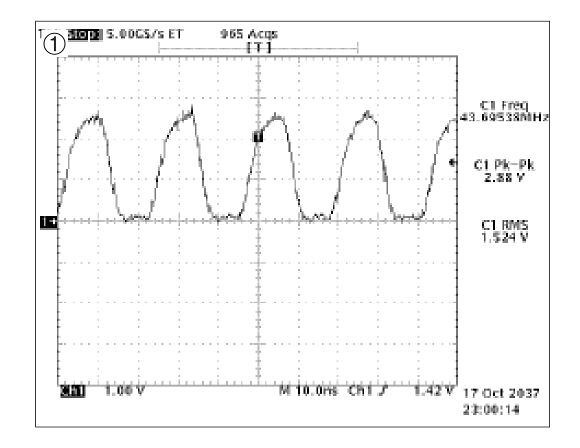
Symptom	- Even though the LED power turns on, the screen is blank when connecting the DVI cable.
Major checkpoints	- Even though the LED power turns on, the screen is blank when connecting the DVI cable. - Check the DVI cable connections. - Check whether the LVDS cable is connected correctly to the panel. - Check whether the lamp connector of the panel is connected correctly to the IP board.
	
Diagnostics	Check the signal cables and their connections. ↓ Yes ① Is X201 oscillating correctly? — No → Check and replace the circuits related to X201. ↓ Yes ② Do the inputs appear at R100, R101, R103, and R107? — No → Check the R100, R101, R103, and R107 input terminals. ↓ Yes Do output signals appear at pins 8 to 30 of CN400? — No → Check the circuits related to CN400 ↓ Yes Can DC 5V be measured at pins 1, 2, and 3 of CN400? — No → Check the Panel EN signal and the BL_EN signal. ↓ Yes Check and replace the panel.
Caution	Make sure to disconnect the power before working on the IP board.

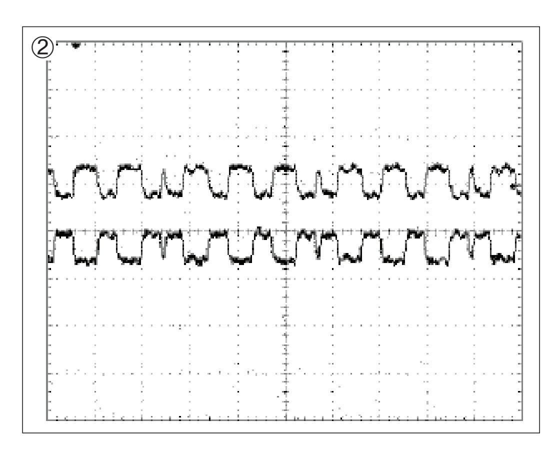
4-4-1. Circuit diagrams when a blank screen is displayed (Digital)





4-4-2. Waveforms when a blank screen is displayed (Digital)





4-5. Error Examples and Actions

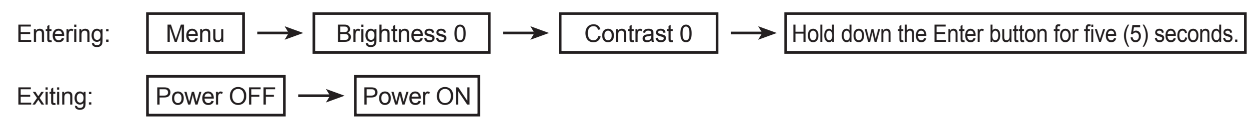
Error Appearance	Symptoms and Actions	Remarks
	Symptom: DVI signals are not recognized. Cause: This error occurs because the PC cannot recognize the mode information since the DVI DDC is not input to the monitor. Action: Input the DVI DDC.	*On how to input DDC, refer to the training manual.
	Symptom: A full white screen is displayed regardless of the signals when turning on the monitor. Cause: This error occurs when only lamp power is supplied and the video signals are not input to the panel due to an LVDS cable connection error. Action: Replace the LVDS cable or connect the cable correctly so that the video signals can be supplied to the panel.	* A Full White pattern is a feature of a TN panel when no video signals are supplied.

4-6. Adjustment

4-6-1. Service Adjustment Conditions

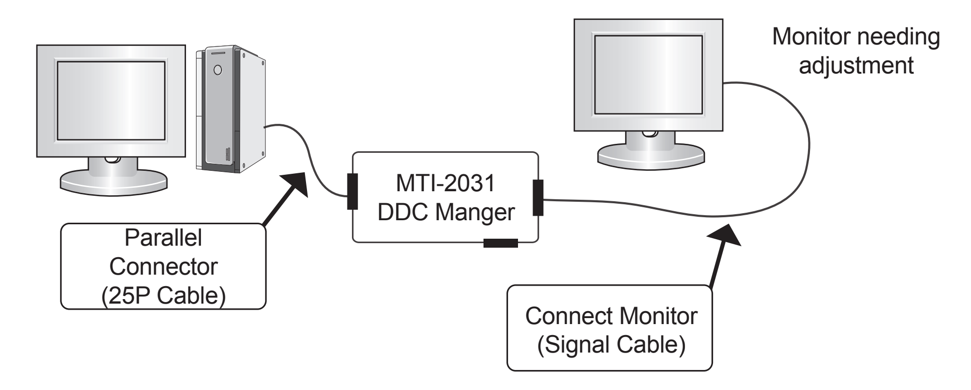
1. Precautions before a Service Adjustment
   1) Check whether the devices for the service adjustment are operating normally.
   2) Secure a space that is sufficiently wide for disassembling the monitor.
   3) Prepare a soft mat on which the monitor will be disassembled.

2. Entering Service Mode



3. Basic Service Items to Perform after Replacing a Board
   1) Check the PC color adjustment status.
   2) Input DDC (input both of Analog and Digital).
   3) Check whether the appropriate MCU code for the model is input.
   4) Hard power the monitor off after entering service mode and performing a reset.

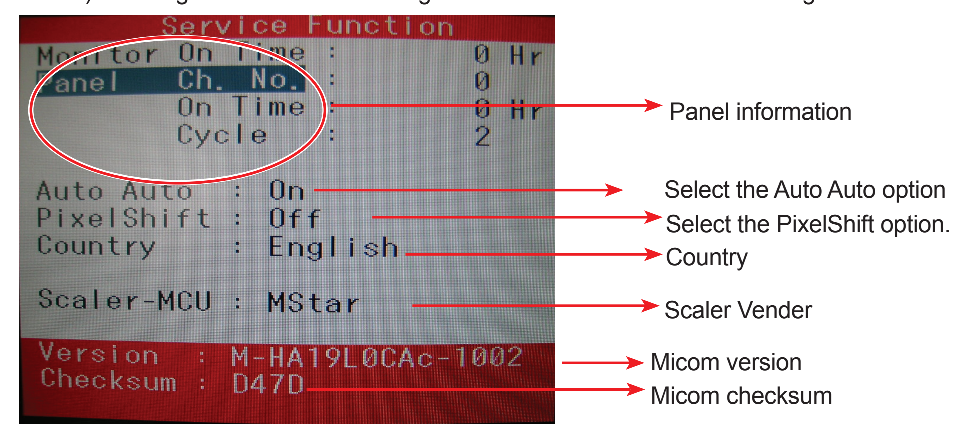
4. DDC EDIT Data Input
   1) Use when updating the AD board code.
   2) Download the WinDDC program, DDC Input program, and Hex and DDC files appropriate to the model through the Quality Control department of Samsung Electronics. Install the jig and input the data, as shown in the figure.



4-6-2. Service Function Specifications

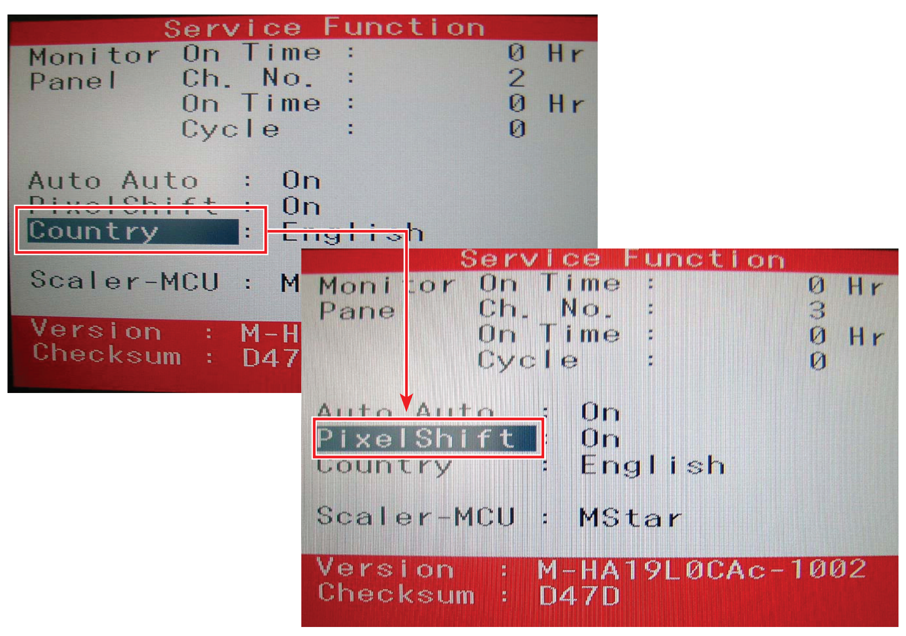
■ Checking the Code Version

1. Check the MCU code version and checksum after entering SVC Mode.
2. Entering SVC Mode
   - Adjust the Brightness and Contrast values to 0.
   - Hold down the Enter button for five (5) seconds.
   - The SVC Function OSD is displayed.
   - To exit the SVC Function, turn the power off.
3. Safe Mode
   - When the input signal is higher than the supported frequency of the product, safe mode gives users some time (one minute) to change the video card settings to the Recommended Mode settings.

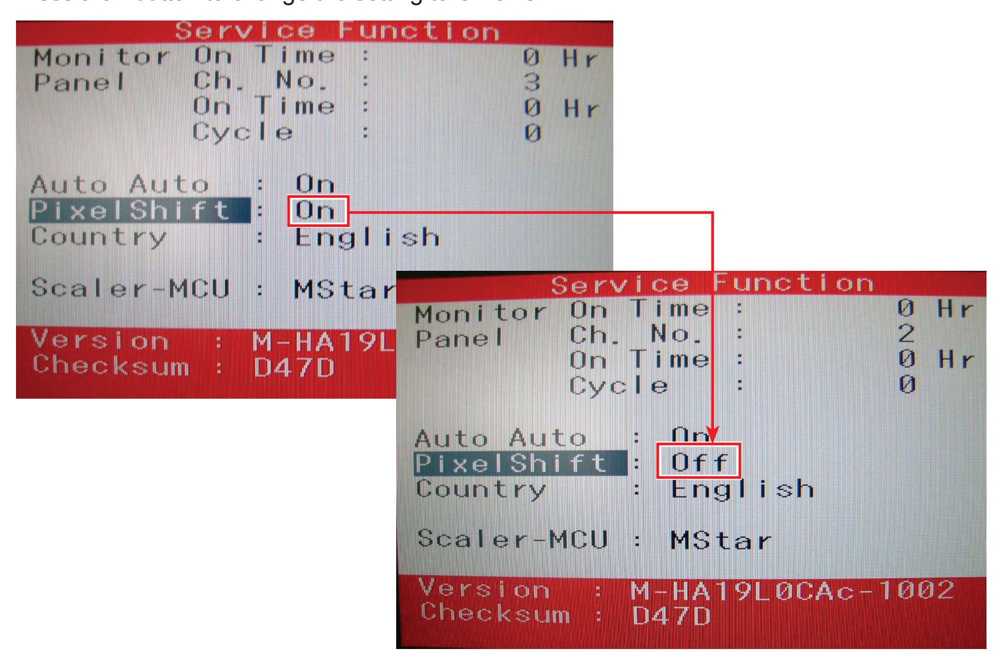


■ Service Mode (Moving around)

1. Press the + button to move to other items.

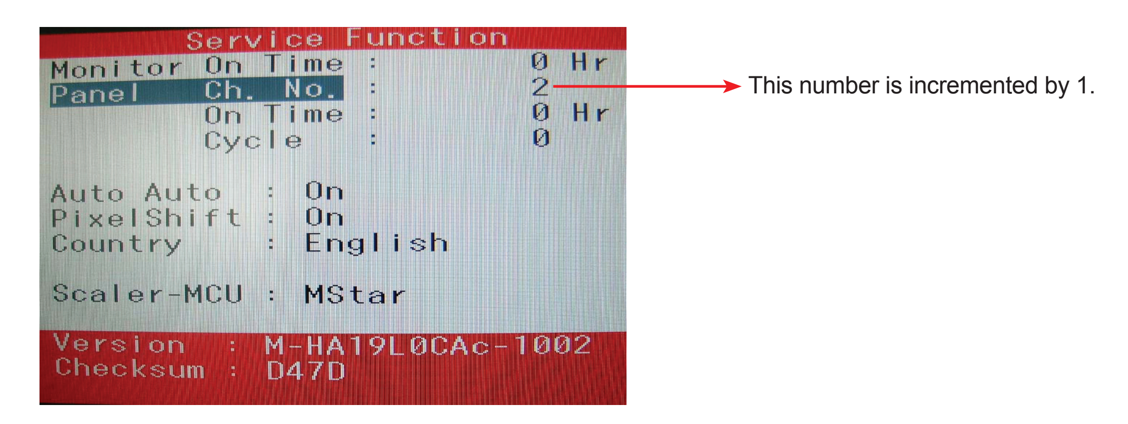


2. Press the - button to change the setting to On or Off.

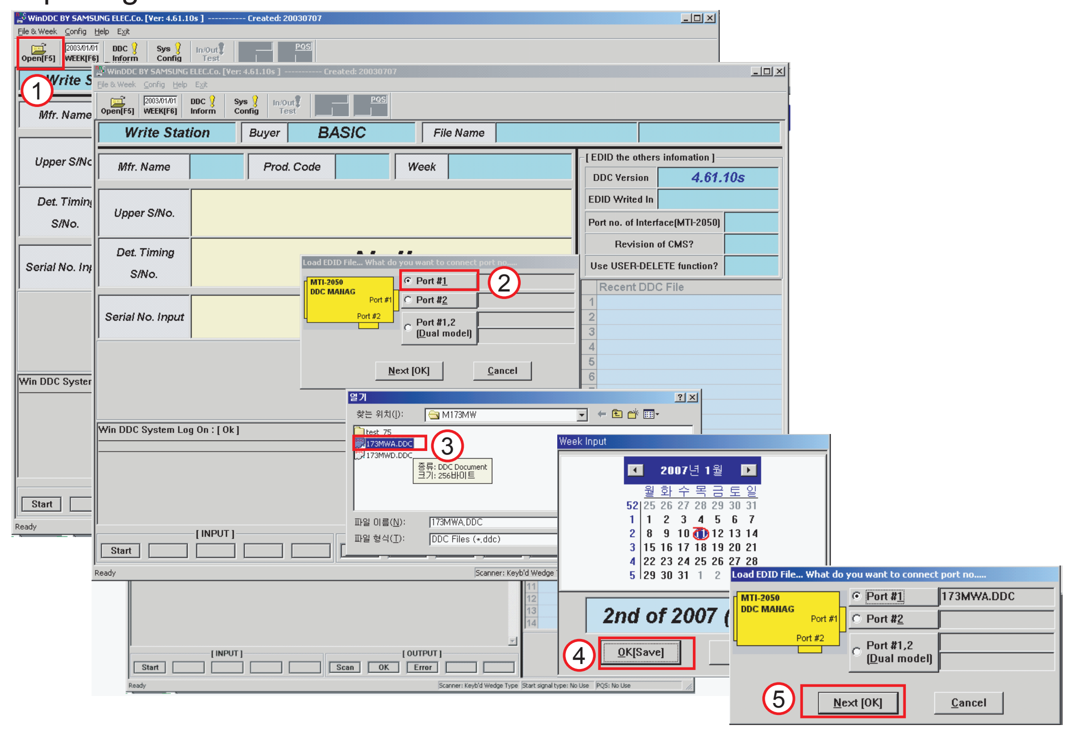


When replacing the panel

After replacing the panel, move to the Panel item and hold down the Menu button for five (5) seconds.
The Ch. No is incremented by 1 and then both the On Time and Cycle are set to 0.

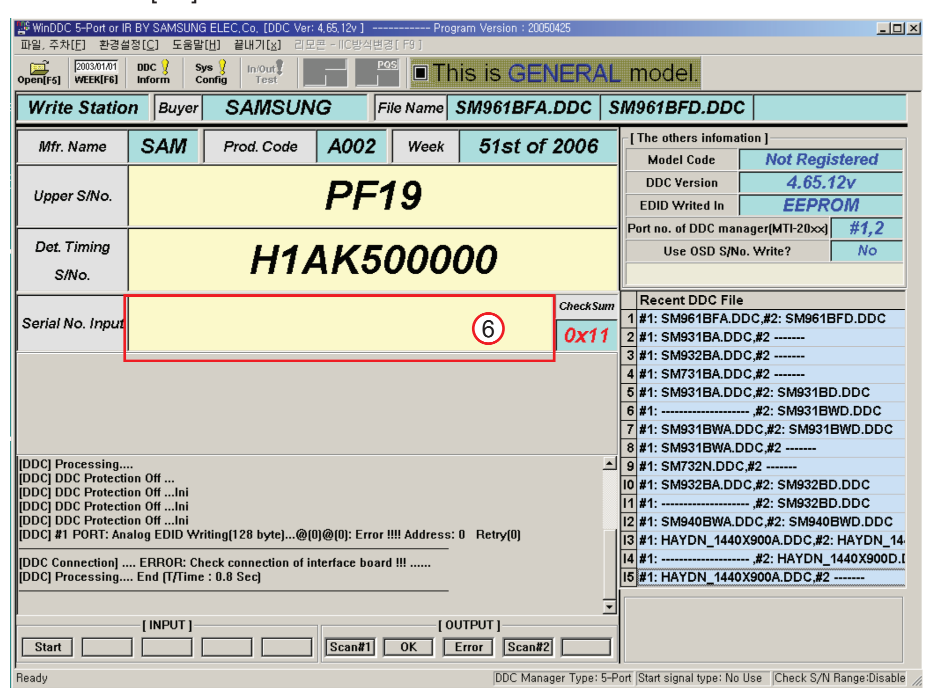


■ Inputting the DDC Data



Use the DDC Manager MTI-2050 version or later.

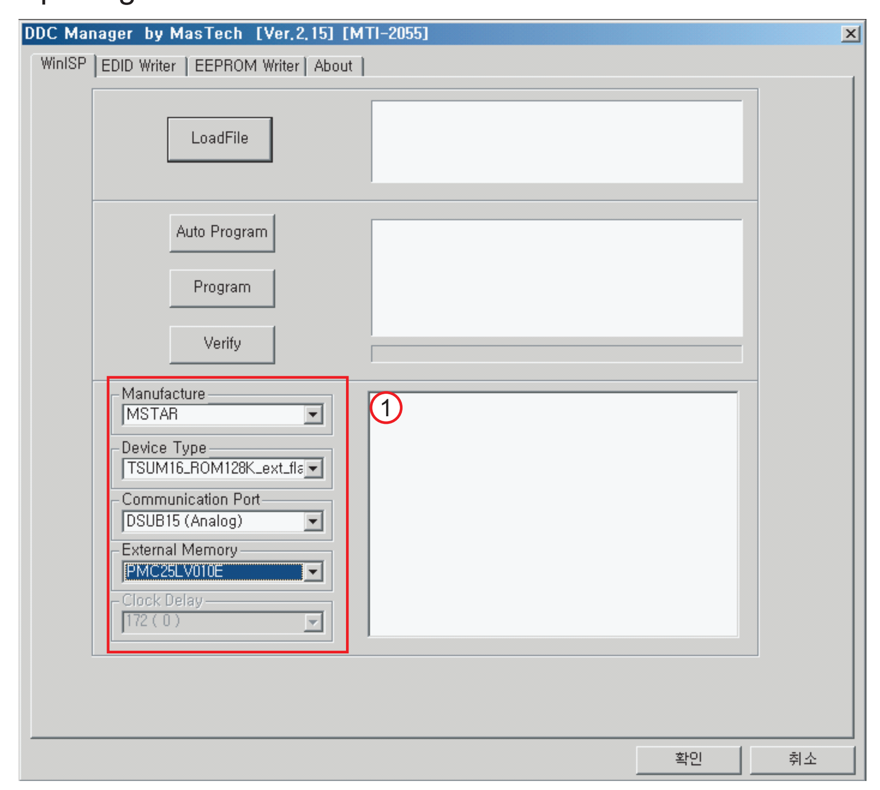
1) Click the Open [F5] icon.
2) Select a port.
3) Open a DDC file.
4) Select a date and click the OK [Save] button.
5) Click the Next [OK] button.



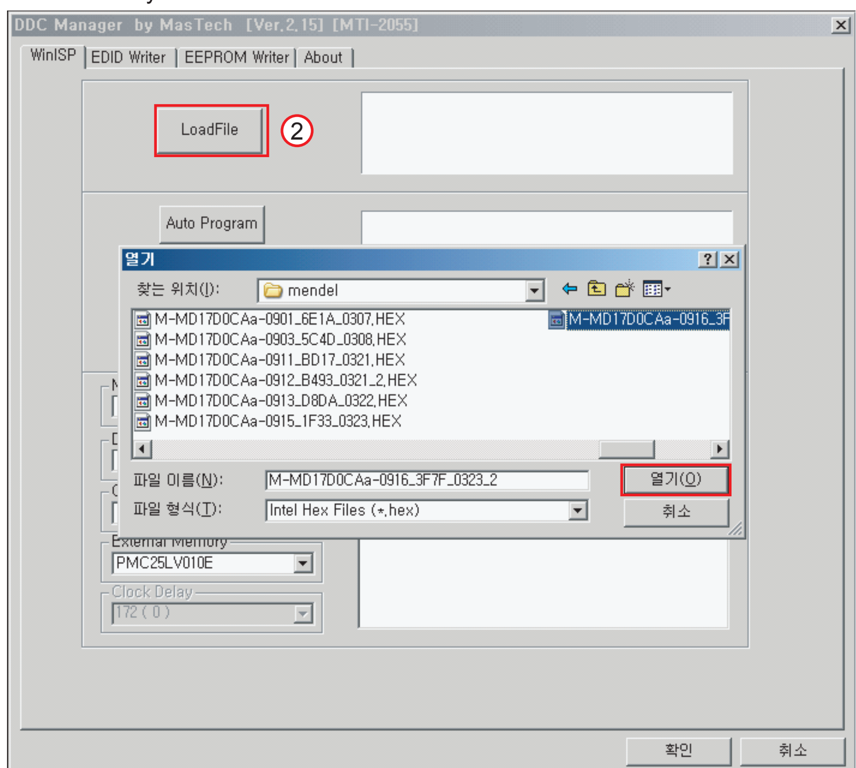
6) Enter the serial number and then press the Enter button

※When inputting digital data after inputting analog data, repeat steps 2 to 5.

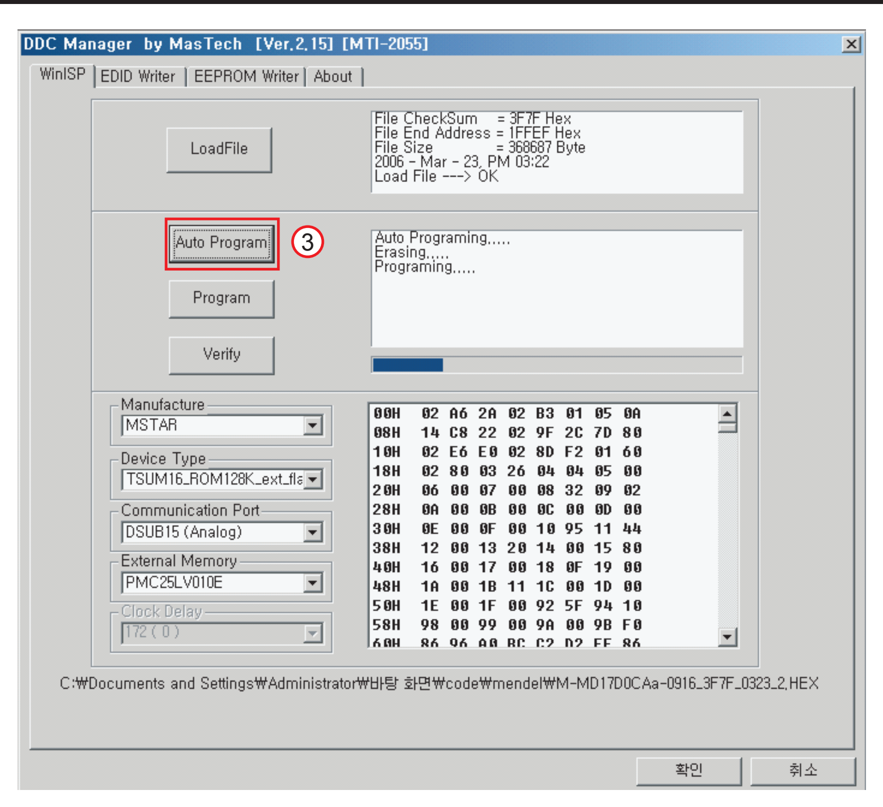
■ Inputting the MCU Data



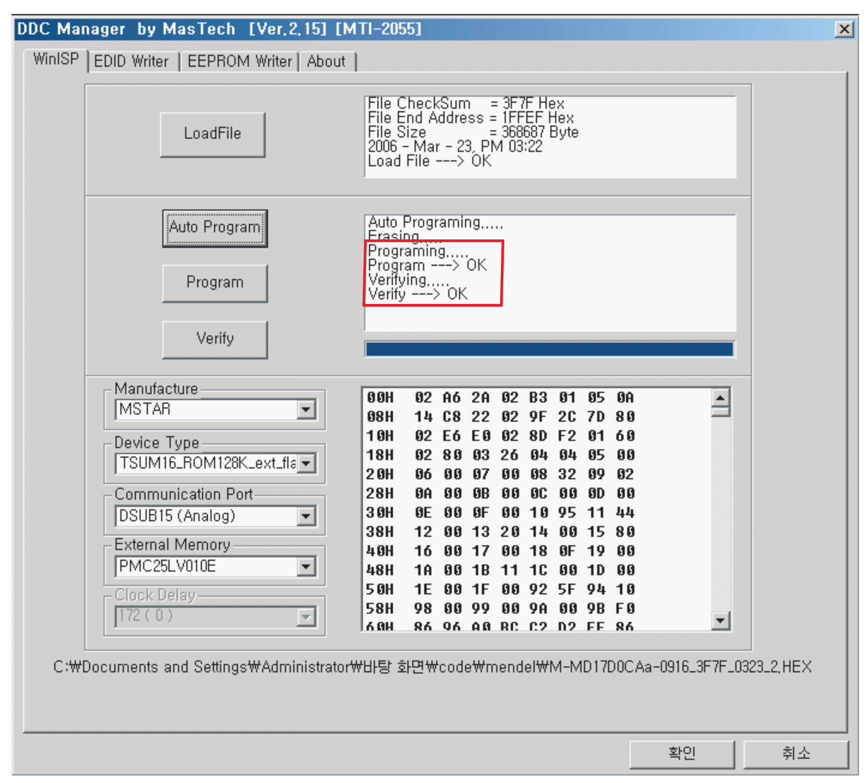
1) Check the following options.
- Manufacture: MSTAR
- Device Type:TSUM16_ROM128K_ext_flash
- Communication Port: DSUB15 (Analog)
- External Memory: PMC25LV010E



2) Click the LoadFile button, select an MCU code file, and then click the Open [O] button.

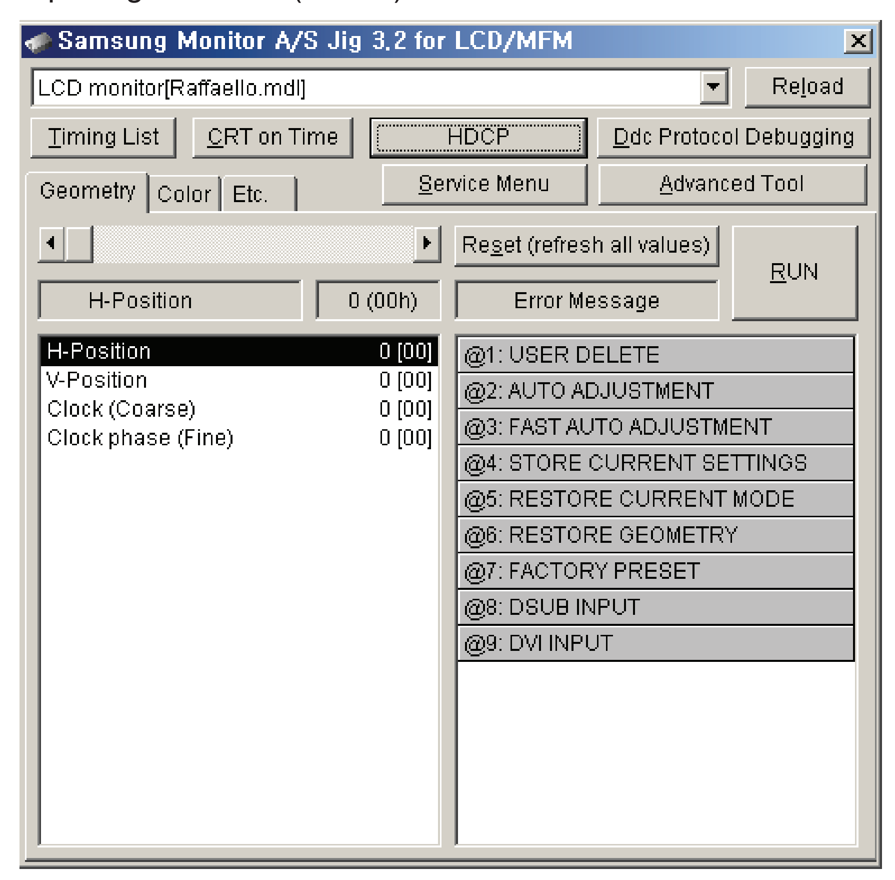


3) Click the Auto Program button.

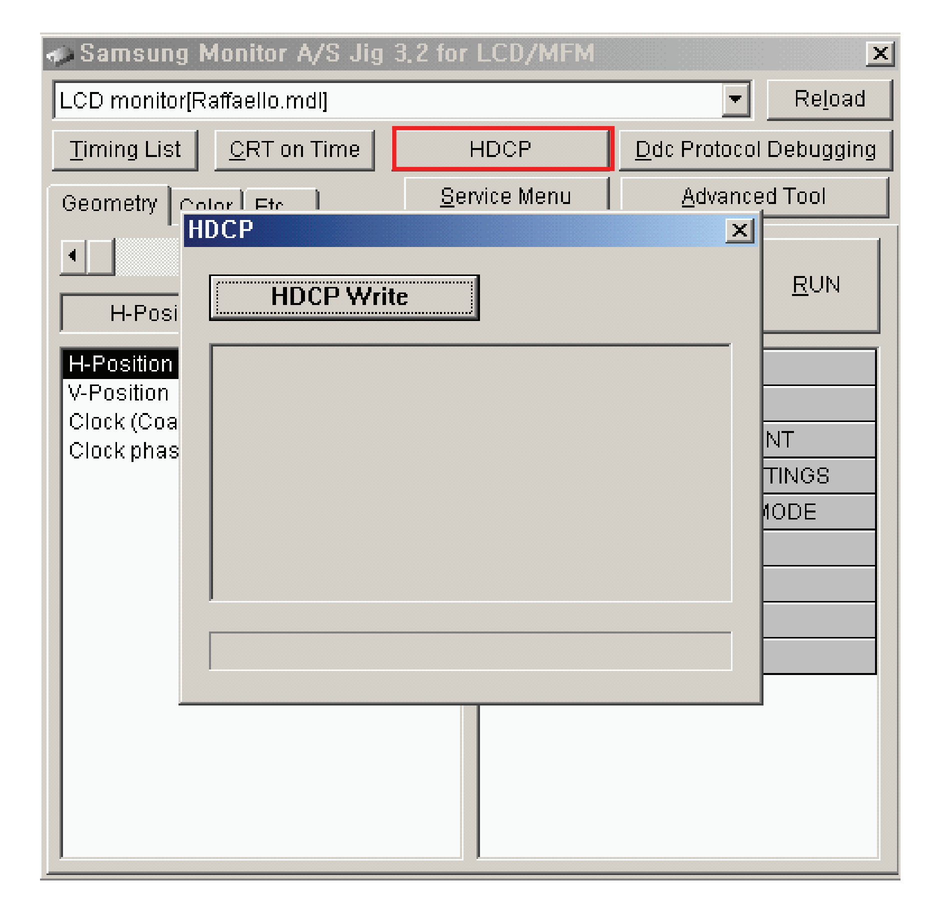


4) When programming and verification are complete, hard power the monitor off and then on again.

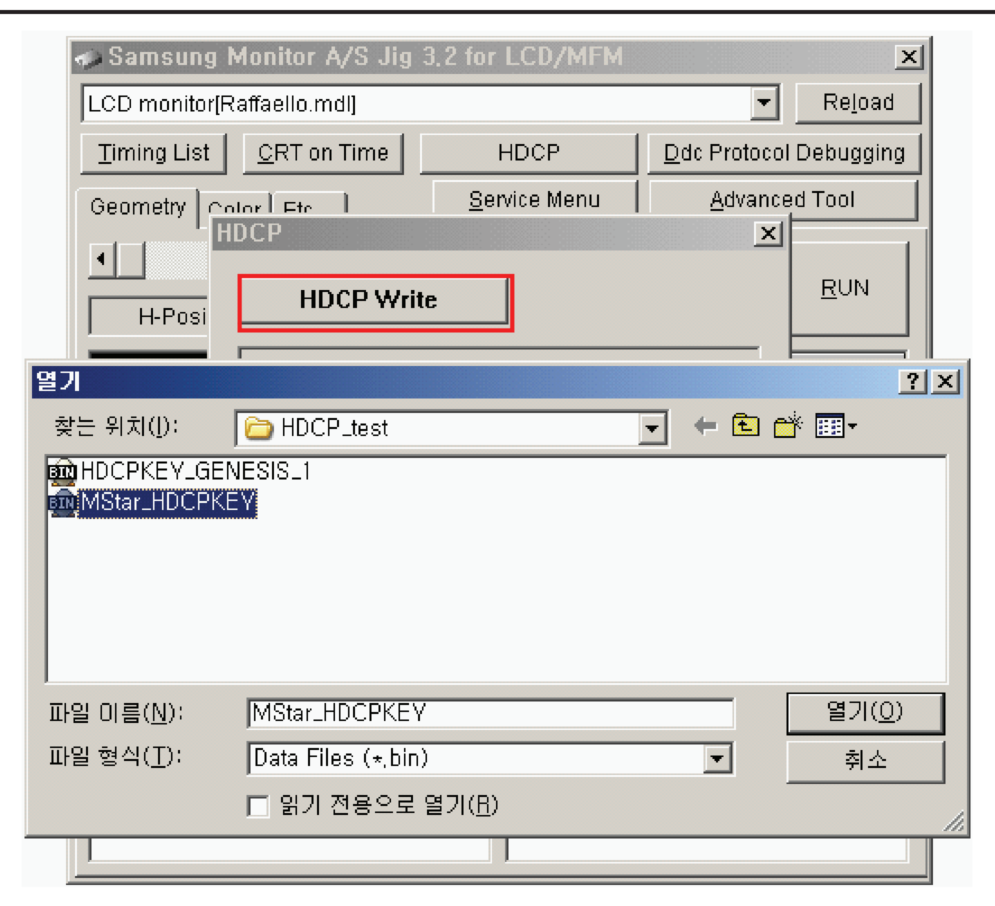
■ Inputting the Code (HDCP)



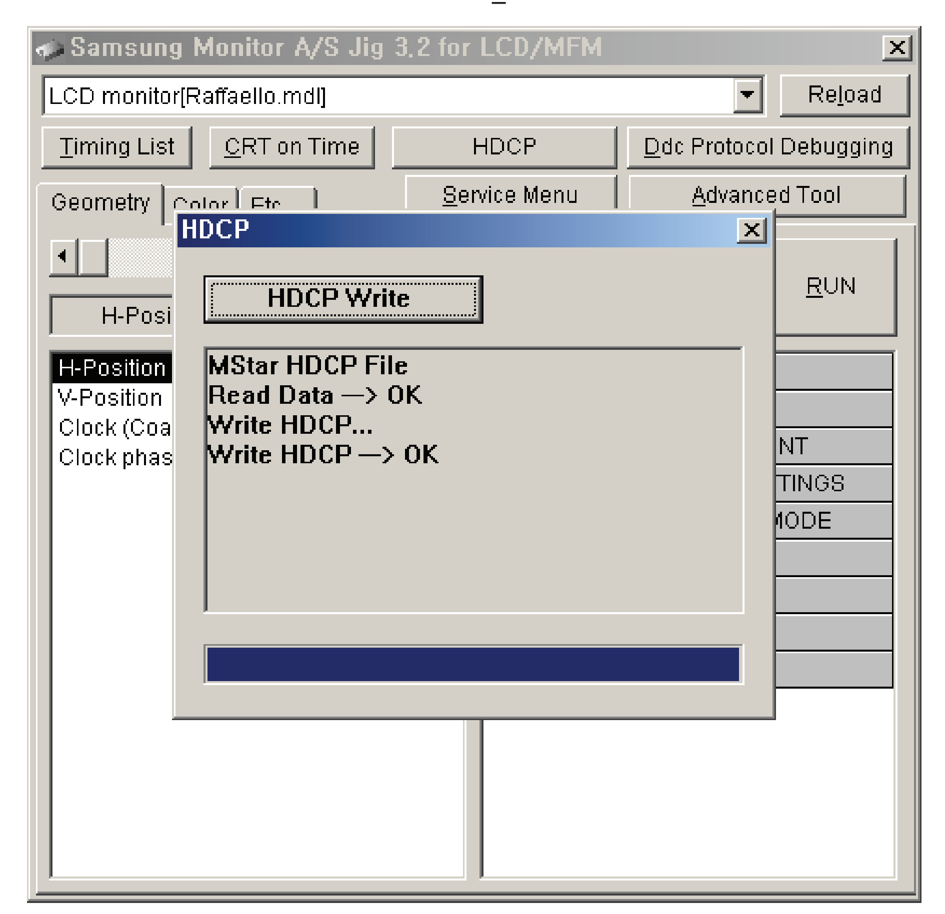
1. Run the service.exe file.



2. Click the HDCP button.



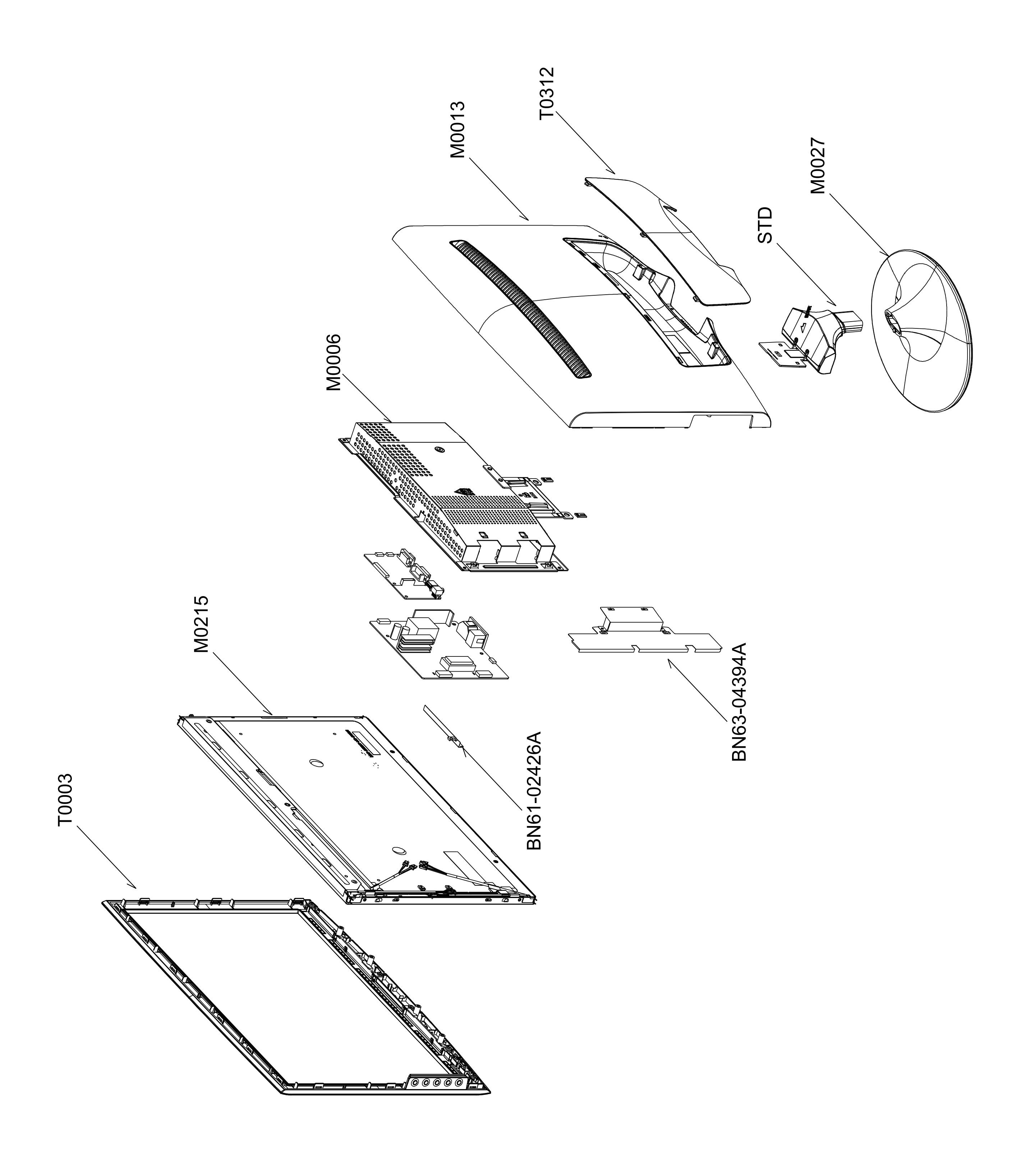
3. Click the HDCP Write button and select MStar_HDCPKEY.



4. Inputting the HDCP key is completed.

5. Exploded View & Part List

5-1. LS22TWHSUV/ZC - Exploded View (T220)



5-1-1. LS22TWHSUV/ZC - Parts List (T220)

Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
M0006	BN96-07346A	ASSY SHIELD P-COVER;LS22TW,SECC T0.8	1	S.N.A	
M0013	BN96-07342A	ASSY COVER P-REAR;LS22TW,PMMA ABS,HB,BK2	1	S.A	
M0027	BN96-07345B	ASSY STAND P-BASE;LS22TW,ABS HB PMMA,RD0	1	S.A	
M0215	BN07-00487A	LCD-PANEL;LTM220M1-L01-2	1	S.A	
STD	BN96-07347C	ASSY STAND P-BODY;LS22TW,PMMA ABS HB,SM5	1	S.A	
T0003	BN96-07343U	ASSY COVER P-FRONT;LS22TW,PMMA+ABS,TOC,R	1	S.A	
T0312	BN96-07929A	ASSY COVER P-REAR SUB;LS22TW,PMMA ABS,HB	1	S.A	
	BN61-02426A	BRACKET-SHIELD;S/M 203B,SPTE,T0.3	1	S.N.A	
	BN63-04394A	SHIELD-LAMP;T22W,SPTE,T 0.3	1	S.N.A	

5-2. LS22TWHSUV/ZC - Parts List

Service Bom (**SA**: SERVICE AVAILABLE, **SNA**: SERVICE NOT AVAILABLE)

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
		LS22TWHSUV/ZC	T220,WSN1/S22T0-LTW,22,LCD-MO,CANADA			
0.1	M0001	BN90-01590M	ASSY COVER FRONT;LS22TW,USA_ POP,T220,ROS	1	S.N.A	
..2	T0003	BN96-07343U	ASSY COVER P-FRONT;LS22TW,PMMA+ABS, TOC,R	1	S.A	
...3	M0081	6003-000282	SCREW-TAPTITE;BH,+,-,B,M3,L8,ZPC(BLK),SW	2	S.N.A	
...3	M0960	BN61-03902A	HOLDER-BOSS;T220,PMMA+ABS,HB,WH15	1	S.N.A	
...3	CCM1	BN63-02183D	COVER-SHEET;Rhcm,PE Vinyl,T0.05,680mm,20	1	S.N.A	
...3	M0112	BN63-04386A	COVER-FRONT;T22W,PMMA+ABS-PMMA,TOC	1	S.N.A	
...3		BN64-00842A	KNOB-GUIDE;T220,PMMA+ABS,HB,BK23,H/ GLOSS	1	S.N.A	
...3	T0022	BN64-00844A	KNOB CONTROL;T220,PMMA+ABS,HB,BK23,H/ GLO	1	S.N.A	
...3	M0102	BN96-07569A	ASSY BLU P;T220D,MB-M0716,WHITE,BLU	1	S.A	
....4		BN94-01893J	ASSY PCB MAIN-BN96-07569A;T,ASSY BLU P	1	S.N.A	
.....5		BN81-01709A	A/S-MOLD FRAME;SR-3108F,46.6X10.524X,BN9	1	S.N.A	
.....5		BN81-01710A	A/S-GUIDE PANEL-L;PC,40.6X7.08X3.4,BN96-	1	S.N.A	
.....5		BN81-01711A	A/S-DIFFUSER SHEET;G25,42.6X10.31,BN96-0	1	S.N.A	
.....5		BN81-01715A	A/S-HARNESS;PST0716-01,BN96-07569A	1	S.N.A	
.....5		BN81-01716A	A/S-SHADING TAPE;#1350,98.9X14.82,-,-,-,	1	S.N.A	
.....5	T0174	BN97-02297N	ASSY SMD;T,W/W	1	S.N.A	
......6		BN81-01712A	A/S-PCB;FR-4,0.6T,8.68X7.05,BN96-07569A	1	S.N.A	
......6		BN81-01713A	A/S-LED;MWHT213Z,BN96-07569A	1	S.N.A	
......6		BN81-01714A	A/S-RESISTOR;RC1206JR-0733R,BN96-07569A	1	S.N.A	
...3	CIS1	BN74-00021A	TAPE-FILAMENT;Filament tape,clear,#8915,	0.06	S.N.A	
...3	M0145	BN96-07890B	ASSY BOARD P-FUNCTION;T,Function Assy,Wi	1	S.A	
....4	M2893	BN39-01007C	LEAD CONNECTOR;T,UL1061#28,5 to 5pin,150	1	S.A	
....4		BN94-01893A	ASSY PCB MAIN-POWER PCB;T	1	S.N.A	
.....5	CN330	3711-002162	HEADER-BOARD TO CABLE;BOX,2P,1R,1.25mm,S	1	S.A	
.....5	CN906	3711-006471	CONNECTOR-HEADER;BOX,5P,1R,1mm,SMD- A,AU,	1	S.N.A	
.....5		BN74-00014A	TAPE-FUNCTION TAPE;DOUBLE FACE TAPE,Acry	1	S.N.A	
.....5	T0174	BN97-02297E	ASSY SMD;T,W/W	1	S.A	
......6	U3	1203-005267	IC-VOL. DETECTOR;KIA7027,TSM,3P,PLASTIC,	1	S.A	
......6	U1	1209-001809	IC-SENSOR;MCS-5000,UQFN,24P,4x4mm,PLA STI	1	S.A	
......6	R3	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
......6	R1	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	S.N.A	
......6	R2	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	S.A	
......6	CN330	3711-005935	HEADER-BOARD TO CABLE;BOX,4P,1R,1mm,SMD-	1	S.A	
......6	PCB	BN41-01034A	PCB-FUNCTION;T Function PCB,FR-4,2,MP 1.	1	S.N.A	
......6	C3	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
......6	C1	2203-006618	C-CER,CHIP;2200nF,+80-20%,16V,Y5V,-,1608	1	S.N.A	
......6	C2	2203-006618	C-CER,CHIP;2200nF,+80-20%,16V,Y5V,-,1608	1	S.N.A	
....4		BN94-01893B	ASSY PCB MAIN-FUNCTION PCB;T	1	S.N.A	

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
.....5	M2893	BN39-01051A	LEAD CONNECTOR;T220D,UL1571#30,UL,4P, #30	1	S.A	
.....5	M0104	BN63-04673A	EARTH-PLATE;T220,PBS SH,T0.15	2	S.N.A	
.....5	T0174	BN97-02297F	ASSY SMD;T,W/W	1	S.N.A	
......6	D1	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
......6	D10	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
......6	D2	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
......6	R3	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	1	S.N.A	
......6	R4	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	1	S.N.A	
......6	R1	2007-000123	R-CHIP;1.5Kohm,5%,1/10W,TP,1608	1	S.N.A	
......6	R2	2007-000123	R-CHIP;1.5Kohm,5%,1/10W,TP,1608	1	S.N.A	
......6	T0313	3404-001209	SWITCH-TACT;12VDC,50mA,250gf,4.5x4.5x1.5	1	S.A	
......6	T0313	3404-001209	SWITCH-TACT;12VDC,50mA,250gf,4.5x4.5x1.5	1	S.A	
......6	T0313	3404-001209	SWITCH-TACT;12VDC,50mA,250gf,4.5x4.5x1.5	1	S.A	
......6	T0313	3404-001209	SWITCH-TACT;12VDC,50mA,250gf,4.5x4.5x1.5	1	S.A	
......6	T0313	3404-001209	SWITCH-TACT;12VDC,50mA,250gf,4.5x4.5x1.5	1	S.A	
......6	PCB	BN41-01033A	PCB-FUNCTION;T Function PCB,FR-4,2,MP 1.	1	S.N.A	
0.1	M0002	BN90-01591A	ASSY COVER REAR;LS22TW_TOC	1	S.N.A	
..2	M0013	BN96-07342A	ASSY COVER P-REAR;LS22TW,PMMA ABS,HB,BK2	1	S.A	
...3	CCM1	BN63-02183D	COVER-SHEET;Rhcm,PE Vinyl,T0.05,680mm,20	0.5	S.N.A	
...3	M0006	BN63-04385A	COVER-REAR;T220,PMMA ABS,HB,BK23,H/ GLOSS	1	S.N.A	
..2	T0312	BN96-07929A	ASSY COVER P-REAR SUB;LS22TW,PMMA ABS,HB	1	S.A	
...3	CCM1	BN63-02183B	COVER-SHEET;Rhcm,PE Vinyl,T0.05,150mm,20	0.4	S.N.A	
...3	M0006	BN63-04387B	COVER-REAR SUB;LS22TW,PMMA ABS,HB,BK23,H	1	S.N.A	
..2	M0081	6003-001086	SCREW-TAPTITE;BH,+,-,B,M3,L12,ZPC(BLK),S	2	S.A	
0.1	M0106	BN91-01803J	ASSY LCD-STZ;LS22MYK*	1	S.N.A	
..2	M0215	BN07-00487A	LCD-PANEL;LTM220M1-L01-2	1	S.A	
0.1	M0112	BN91-02160A	ASSY SHIELD;LS22TW_TOC	1	S.N.A	
..2		BN63-04394A	SHIELD-LAMP;T22W,SPTE,T 0.3	1	S.N.A	
..2	CIS1	BN74-00021A	TAPE-FILAMENT;Filament tape,clear,#8915,	0.12	S.N.A	
..2	CIS1	BN74-00021A	TAPE-FILAMENT;Filament tape,clear,#8915,	0.08	S.N.A	
0.1	M0017	BN91-02161A	ASSY CHASSIS;LS22TWHSUV/EN	1	S.A	
..2	M0081	6003-001439	SCREW-TAPTITE;BH,+,-,S,M4,L8,ZPC(WHT),SW	1	S.N.A	
..2	M0174	BN44-00182N	IP BOARD;IP-49135B(DPMS),MCKINLEY 22",3.	1	S.A	
..2		BN61-02426A	BRACKET-SHIELD;S/M 203B,SPTE,T0.3	1	S.N.A	
..2	M0014	BN94-01736A	ASSY PCB MAIN-STZ;LS22TWHSUV/EN	1	S.A	
...3	T0245	0202-001608	SOLDER-WIRE FLUX;LFC7-107,D0.8,99.3Sn/0.	0.003	S.N.A	
...3	CN102	3701-001173	CONNECTOR-DVI;24P,3R,FEMALE,ANGLE,AUF	1	S.A	
...3	CN101	3701-001219	CONNECTOR-DSUB;15P,3R,FEMALE,ANGLE, AUF	1	S.A	
...3	CN600	3711-004261	HEADER-BOARD TO BOARD;BOX,12P,1R,2mm,ANG	1	S.A	
...3	HDCP	BN97-00707A	ASSY HDCP;BN46-00018A,BR20/21BS_ CS,MSTAR	1	S.N.A	

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4		BN46-00018A	KEY CODE-CERTIFICATE;(HDCP KEY)PPM42M5S,	1	S.N.A	
...3	T0174	BN97-02124A	ASSY SMD;LS22TWHSUV/EN	1	S.N.A	
....4	SUB05	0202-001477	SOLDER-CREAM;LST309-M,-,D20~45um,96.5Sn/	0.528	S.N.A	
....4	D100	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D101	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D102	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D103	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D104	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D105	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D106	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D107	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D108	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D109	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D110	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO	1	S.A	
....4	D600	0402-001614	DIODE-RECTIFIER;S1G,400V,1A,DO-214AC,TP	1	S.A	
....4	D601	0402-001614	DIODE-RECTIFIER;S1G,400V,1A,DO-214AC,TP	1	S.A	
....4	ZD100	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD101	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD102	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD103	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD104	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD105	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD106	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD202	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD203	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD204	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD601	0403-001411	DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T	1	S.N.A	
....4	ZD200	0406-001061	DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S	1	S.A	
....4	ZD201	0406-001061	DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S	1	S.A	
....4	Q201	0501-000445	TR-SMALL SIGNAL;KTC3875S-Y,NPN,150mW,SOT	1	S.A	
....4	Q203	0501-000445	TR-SMALL SIGNAL;KTC3875S-Y,NPN,150mW,SOT	1	S.A	
....4	Q204	0501-000445	TR-SMALL SIGNAL;KTC3875S-Y,NPN,150mW,SOT	1	S.A	
....4	Q601	0501-000445	TR-SMALL SIGNAL;KTC3875S-Y,NPN,150mW,SOT	1	S.A	
....4	Q202	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A	
....4	Q205	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A	
....4	Q207	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A	
....4	Q602	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	S.A	

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4	Q409	0505-001165	FET-SILICON;SI3443BDV,P,-20V,+-4.4A,65mo	1	S.A	
....4	Q409	0505-001165	FET-SILICON;SI3443BDV,P,-20V,+-4.4A,65mo	1	S.A	
....4	IC112	1103-000129	IC-EEPROM;24C02,2Kbit,256x8Bit,SOP,8P,5x	1	S.A	
....4	IC112	1103-000129	IC-EEPROM;24C02,2Kbit,256x8Bit,SOP,8P,5x	1	S.A	
....4	IC112	1103-001410	IC-EEPROM;S-24CS08AFJ-TB-1GE,8Kbit,1Kx8,	1	S.A	
....4	T0087	1203-003695	IC-POSI.FIXED REG.;NCP1117ST33T3G,SOT-22	1	S.A	
....4	T0087	1203-003695	IC-POSI.FIXED REG.;NCP1117ST33T3G,SOT-22	1	S.A	
....4	T0087	1203-003696	IC-POSI.FIXED REG.;NCP1117DT18T5G,DPAK,3	1	S.A	
....4	IC109	1205-003255	IC-LCD CONTROLLER;SE758MRH-LF,PQFP,128P,	1	S.A	
....4	R100	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R101	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R102	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R103	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R104	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R105	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R106	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R107	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R204	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R205	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R227	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R228	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R111	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R113	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R114	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R117	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R118	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R120	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R132	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R202	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R203	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R206	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R207	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R212	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R213	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R216	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R230	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R231	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R245	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R250	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R251	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R252	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R255	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	S.A	
....4	R108	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R123	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R270	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R209	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R218	2007-000083	R-CHIP;3Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R229	2007-000083	R-CHIP;3Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R219	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R223	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	S.A	

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4	R234	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R600	2007-000088	R-CHIP;7.5Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R109	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R126	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R130	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R131	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R200	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R201	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R210	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R211	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R214	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R215	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R217	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R220	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R221	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R222	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R224	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R226	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R233	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R236	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R253	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R271	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R601	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R602	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R603	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R612	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R225	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R604	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	S.A	
....4	R125	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R232	2007-000309	R-CHIP;10ohm,5%,1/10W,TP,1608	1	S.A	
....4	R273	2007-000309	R-CHIP;10ohm,5%,1/10W,TP,1608	1	S.A	
....4	R116	2007-000821	R-CHIP;390ohm,1%,1/10W,TP,1608	1	S.N.A	
....4	R235	2007-000821	R-CHIP;390ohm,1%,1/10W,TP,1608	1	S.N.A	
....4	R110	2007-001002	R-CHIP;510ohm,5%,1/10W,TP,1608	1	S.N.A	
....4	R121	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	S.A	
....4	R122	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	S.A	
....4	R112	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.N.A	
....4	R115	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.N.A	
....4	R119	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	S.N.A	
....4	C201	2203-000236	C-CER,CHIP;0.1nF,5%,50V,C0G,1608	1	S.N.A	
....4	C202	2203-000236	C-CER,CHIP;0.1nF,5%,50V,C0G,1608	1	S.N.A	
....4	C229	2203-000236	C-CER,CHIP;0.1nF,5%,50V,C0G,1608	1	S.N.A	
....4	C109	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C218	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C221	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C116	2203-000384	C-CER,CHIP;0.015nF,5%,50V,C0G,1608	1	S.N.A	
....4	C115	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,1608	1	S.N.A	
....4	C210	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,1608	1	S.N.A	
....4	C211	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,1608	1	S.N.A	
....4	C106	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,TP,1608	1	S.A	

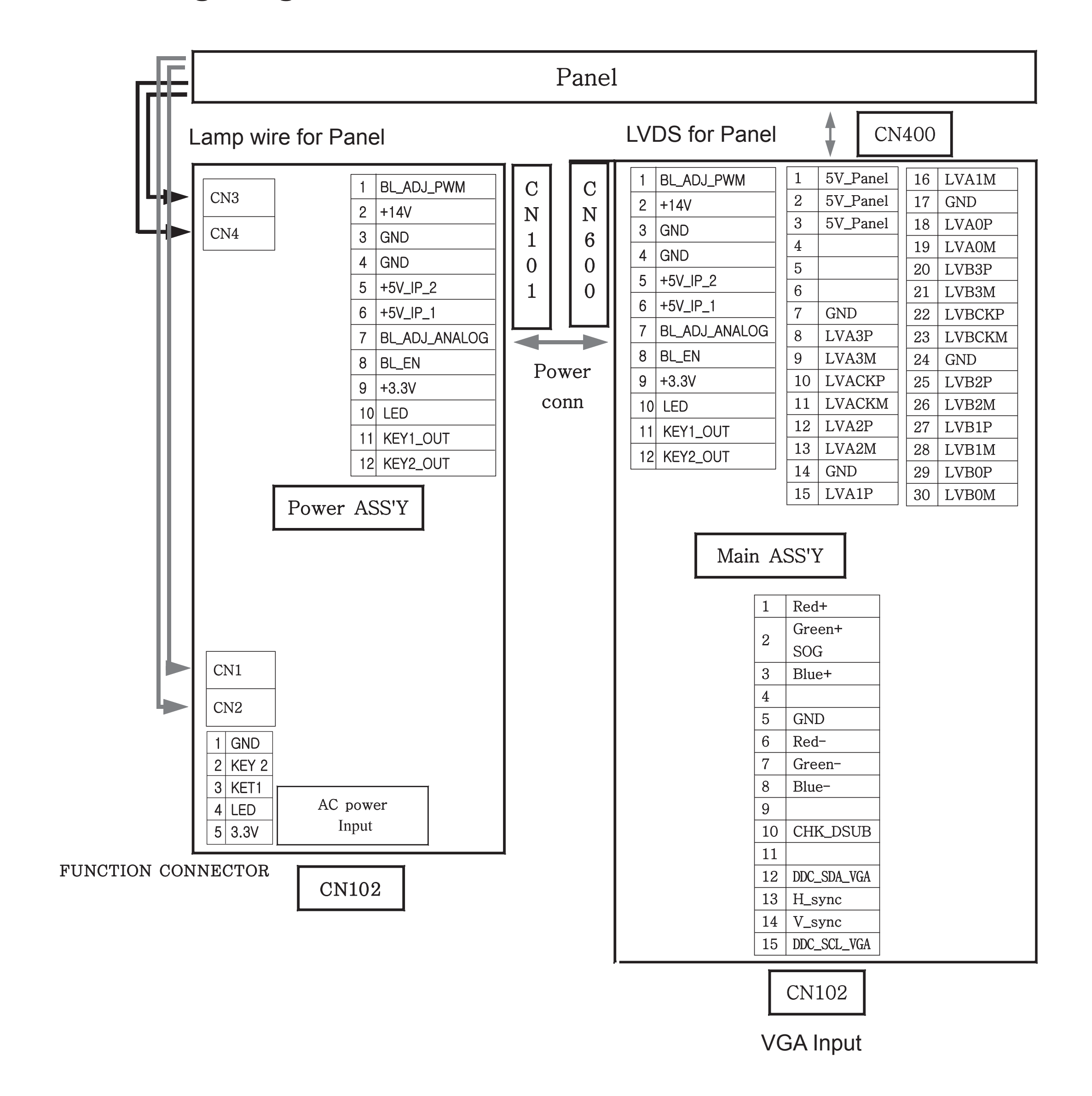
Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4	C107	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C108	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C110	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C111	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C112	2203-000888	C-CER,CHIP;4.7nF,10%,50V,X7R,TP,1608	1	S.A	
....4	C100	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C101	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C103	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C117	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C118	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C119	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C120	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C121	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C122	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C123	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C124	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C125	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C130	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C200	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C203	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C204	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C205	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C206	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C209	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C212	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C213	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C230	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C231	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C234	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C600	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C601	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C603	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C604	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C605	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C606	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C610	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C612	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C613	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C614	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C617	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C618	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C619	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C620	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C621	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C622	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C623	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C626	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C627	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C628	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C630	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	

Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4	C631	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C632	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C635	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C636	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C637	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C638	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C640	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C641	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	S.A	
....4	C208	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	S.N.A	
....4	C220	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	S.N.A	
....4	C228	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	S.N.A	
....4	C608	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	S.N.A	
....4	C207	2203-005437	C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216	1	S.N.A	
....4	C602	2203-005437	C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216	1	S.N.A	
....4	C607	2402-001128	C-AL,SMD;100μF,20%,16V,-,TP,6.3X5.7mm	1	S.A	
....4	C629	2402-001128	C-AL,SMD;100μF,20%,16V,-,TP,6.3X5.7mm	1	S.A	
....4	C639	2402-001128	C-AL,SMD;100μF,20%,16V,-,TP,6.3X5.7mm	1	S.A	
....4	X202	2801-003667	CRYSTAL-SMD;14.31818MHz,30ppm,28-AAN,16p	1	S.A	
....4	T0568	3301-001407	BEAD-SMD;30ohm,1608,300mA,TP,,,0.4ohm	1	S.N.A	
....4	T0568	3301-001407	BEAD-SMD;30ohm,1608,300mA,TP,,,0.4ohm	1	S.N.A	
....4	M0106	3708-001150	CONNECTOR-FPC/FFC/PIC;30P,1mm,SMD-A,SN,Y	1	S.A	
....4	M0018	BN97-02125A	ASSY MICOM;LS22TWHSUV/EN	1	S.N.A	
.....5	IC115	1107-001614	IC-FLASH MEMORY;MX25L1005,1Mbit,1Mx1Bit,	1	S.N.A	
....4	R208	2007-000134	R-CHIP;33Kohm,5%,1/10W,TP,1608	1	S.N.A	
....4	T0077	BN41-01029B	PCB MAIN;T Project_0.3W,CEM-3,2,MP 1.1,1	1	S.N.A	
..2	M0006	BN96-07346A	ASSY SHIELD P-COVER;LS22TW,SECC T0.8	1	S.N.A	
...3		BN61-02429D	STUD-PEM;PNB,M2.8,D7,L20,ZPC(SIL),SUM24L	1	S.N.A	
...3		BN61-03903A	BRACKET-STAND FRAME;T22W,SECC,T 1.6	1	S.N.A	
...3	M0107	BN63-04395A	SHIELD-COVER;T22W,SECC,T 0.8	1	S.N.A	
...3	T0527	AA65-00011C	CLAMPER CORE-WIRE;ALL MODEL,NYLON 66,V2,	1	S.N.A	
...3	M0131	BN63-03474A	GASKET;HUBBLE 27",Polyurethane+Polyester	3	S.N.A	
...3		BN61-03594A	SPRING ETC-STAND;Mckinley,SUS304,T0.3,SI	1	S.N.A	
..2	M0251	BN96-02854N	ASSY CABLE P;Fininfarina,FLAT CABLE,-,15	1	S.A	
..2	M0081	6003-000264	SCREW-TAPTITE;PWH,+,-,B,M3,L6,ZPC(WHT),S	2	S.A	
..2	M0081	6003-000264	SCREW-TAPTITE;PWH,+,-,B,M3,L6,ZPC(WHT),S	1	S.A	
0.1	M0019	BN92-03315D	ASSY LABEL;LS22TWHSUV/ZA	1	S.N.A	
0.1	M0045	BN92-03317S	ASSY ACCESSORY;LS22TWHSUV/ZA	1	S.N.A	
..2	M0125	BN39-00246L	CBF SIGNAL-DVI(D);DVI-Cable,24P/24P,2027	1	S.A	
..2	M0254	BN96-07287N	ASSY ACCESSORY-CABLE&MANUAL;LS22TWHSUV/Z	1	S.A	
...3	T0268	3903-000085	CBF-POWER CORD;DT,US,BP3/YES,I(IEC C13/C	1	S.A	
...3	T0524	6902-000110	BAG PE;LDPE,T0.05,W250,L400,TRP,28,2,-,9	1	S.N.A	
...3		BH68-00261F	MARK RECYCLE-CARD WARRANTY-05;SyncMaster	1	S.N.A	
...3		BH68-00344C	MARK RECYCLE-03,WARRANTY CARD;SECA W'TY	1	S.N.A	
...3	M0215	BN96-07349A	ASSY MANUAL P-IB+QSG;T220,T200,T190,W/W,	1	S.N.A	

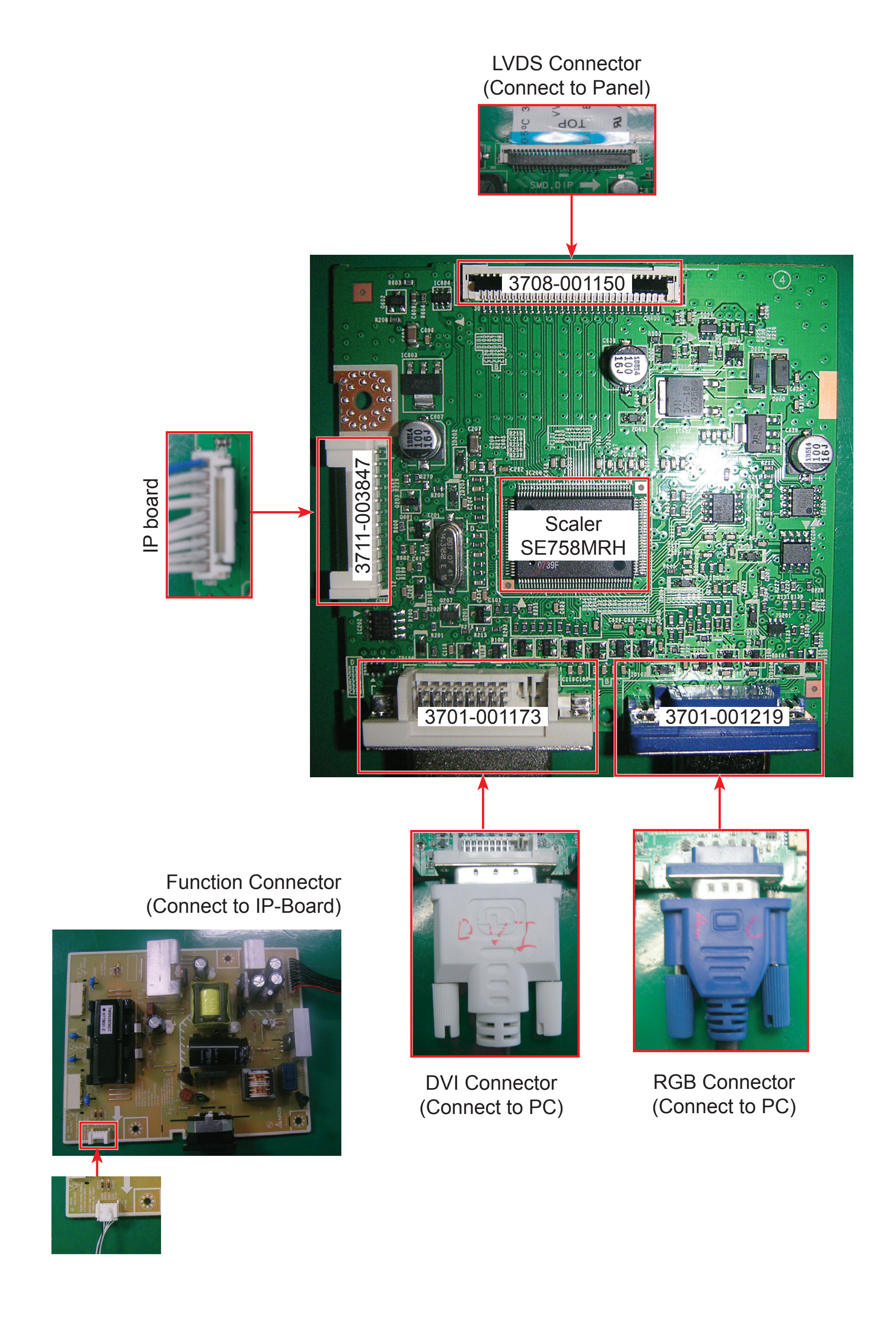
Level	Location No.	Code No.	Description & Specification	Q'ty	SA/SNA	Remark
....4		BH68-00376L	MANUAL FLYER-06,QSG;LCDQUICK SETUP GUIDE	1	S.N.A	
....4		BN59-00716A	S/W DRIVER-04,IB;T220,T200,T190,Syncmast	1	S.N.A	
...3		BN68-01600B	MANUAL FLYER-01, LEAFLET;COMM,SAMSUNG,En	1	S.N.A	
...3	M9889	BN63-02368B	CLOTH-CLEAN;cloth,120,160,sea blue,ToC	1	S.N.A	
..2	STD	BN96-07347C	ASSY STAND P-BODY;LS22TW,PMMA ABS HB,SM5	1	S.A	
...3	M0081	6003-000275	SCREW-TAPTITE;BH,+,-,B,M3,L10,ZPC(BLK),S	5	S.N.A	
...3	T0524	6902-000956	BAG PE;HDPE/NITRON,T0.015/T0.5,W200,L200	1	S.N.A	
...3		BN63-04389A	COVER-STAND FRONT;T220,PMMA+ABS,HB, BK23,	1	S.N.A	
...3		BN63-04392A	COVER-STAND REAR;T220,PMMA+ABS,HB,B K23,H	1	S.N.A	
...3	T0054	BN96-07341B	ASSY HINGE P;LS22TW,SM50 T2.0	1	S.N.A	
....4		BN60-00073A	SPACER-WASHER;Mckinley,SK-5,6.0,12.0,T0.	6	S.N.A	
....4		BN61-03855A	SPRING ETC-DISK;Mckinley,SK-5,6.0,12.0,T	6	S.N.A	
....4		BN61-03904B	BRACKET-STAND TILT;T-PROJECT(22W),SM50C,	1	S.N.A	
....4		BN61-03905A	BRACKET-STAND BODY;T22W,HGI,T 2.0	1	S.N.A	
....4		BN66-00015A	SHAFT-HINGE;Mckinley,S45C,12.0	2	S.N.A	
..2	M0114	BN39-00244G	CBF SIGNAL;D-sub cable,15P/15P,20276N,15	1	S.A	
..2	M0027	BN96-07345B	ASSY STAND P-BASE;LS22TW,ABS HB PMMA,RD0	1	S.A	
...3	M0081	6003-000115	SCREW-TAPTITE;BH,+,B,M3,L6,ZPC(BLK),SW RC	4	S.N.A	
...3	CIS4	BN61-01717A	HOLDER-STAND;BIZET,NI PLT,CH,+,M4,L11(5)	1	S.N.A	
...3		BN61-03907A	BRACKET-STAND BOTTOM;T22W,SECC,T 0.8	1	S.N.A	
...3	CCM1	BN63-02183K	COVER-SHEET;Rhcm,PE Vinyl,T 0.05,250MM,2	0.3	S.N.A	
...3	T0004	BN63-04390A	COVER-STAND BASE;T220,PMMA+ABS,HB,R D02,H	1	S.N.A	
...3		BN68-01519A	MANUAL FLYER-QSG;COMM,SyncMaster,WW, Mojo	1	S.N.A	
...3		BN96-06529A	ASSY HOLDER P-WIRE;MCKINLEY,ABS HB,BK23	1	S.N.A	
....4		6902-000336	BAG ZIPPER;LDPE,T0.05,W70,L80,TRP,-,-,-,	1	S.N.A	
....4	M0114	BN61-03555A	HOLDER-WIRE;MCKINLEY,ABS HB,BK26	1	S.N.A	
...3	T0132	BN73-00077A	RUBBER FOOT;MATISSE,BUMPON,Φ13.5,T2.0,6	4	S.N.A	
...3	T0132	BN73-00077A	RUBBER FOOT;MATISSE,BUMPON,Φ13.5,T2.0,6	4	S.N.A	
...3	T0524	6902-000109	BAG PE;HDPE,T0.015,W350,L430,TRP,28,2,-,	1	S.N.A	
0.1	M0113	BN92-03360A	ASSY P/MATERIAL;LS22TWHSUV/EN	1	S.N.A	
..2	T0376	6902-000061	BAG AIR;LDPE,T0.2,W500,L1000,TRP,-,-,-,3	0.007	S.N.A	
..2	T0376	6902-000379	BAG AIR;LDPE,T0.2,W1000,L1800,TRP,-,-,-,	0.002	S.N.A	
..2	T0003	6902-000604	BAG WRAPPING;LDPE,T0.02,W500,L10000,TRP,	1.36	S.N.A	
..2	M0081	6902-000609	BAG ROLL;LDPE,T0.05,W2400,L1000,TRP,-,-,	0.033	S.N.A	
..2	T0524	6902-000969	BAG PE;HDPE/HDPE/NITRON,T0.015/T0.015/T0	1	S.N.A	
0.1	M0003	BN92-03363F	ASSY BOX;LS22TWHSUV/ZA	1	S.N.A	
..2		BN96-02895A	ASSY MISC P-01,HANDLE PACKING;ALL MODEL,	1	S.N.A	
...3	M0103	BN66-00007A	LEVER-TOP;ALL MODEL,LDPE,WHITE	1	S.N.A	
...3	M0102	BN66-00008A	LEVER-BOTTOM;ALL MODEL,LDPE,WHITE	1	S.N.A	
..2		BN69-02599G	BOX-02,SET;T22,CB,A-01,SW-55,W589,D530,H	1.02	S.N.A	

6. Wiring Diagram

6-1. Wiring Diagram - Main Board



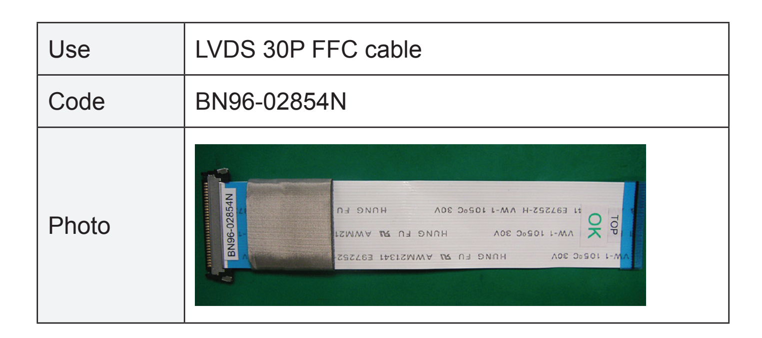
6-2. Wiring Diagram - IP Board



6-3. Connector Functions

Connector	Functions
CN101 ↔ CN600	Supplies 5V from the power board to the main board and transmits the PWM output from the power board to the inverter. *When a problem occurs: The No Power and Blank Screen errors may occur.
CN1 ~ CN4 In	Transmits the lamp current (6mA ~ 7mA) generated in the inverter to the lamp of the panel. * When a problem occurs: The Blank Screen error may occur.
CN102	Transmits the input power of 90 to 263V to the power board. * When a problem occurs: The No Power error may occur.
CN101	Connects the function board. * When a problem occurs: The No LED screen and Function failure errors may occur.
CN102	VGA signal input terminal * When a problem occurs: The No RGB output error may occur.
CN400	Transmits the LVDS signals from the main board to the panel. * When a problem occurs: The Blank screen and No Power errors may occur.

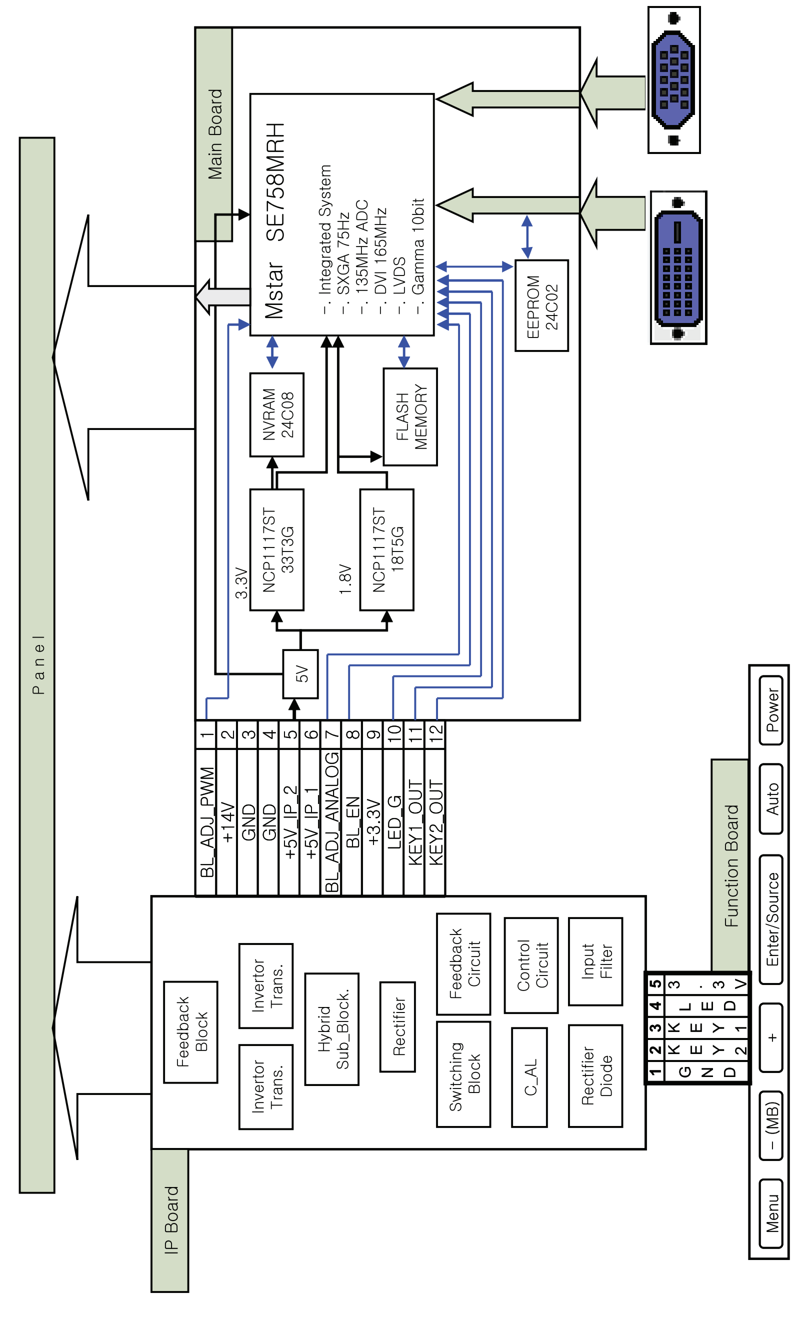
6-4. Cables

Use	LVDS 30P FFC cable
Code	BN96-02854N
Photo	

Memo

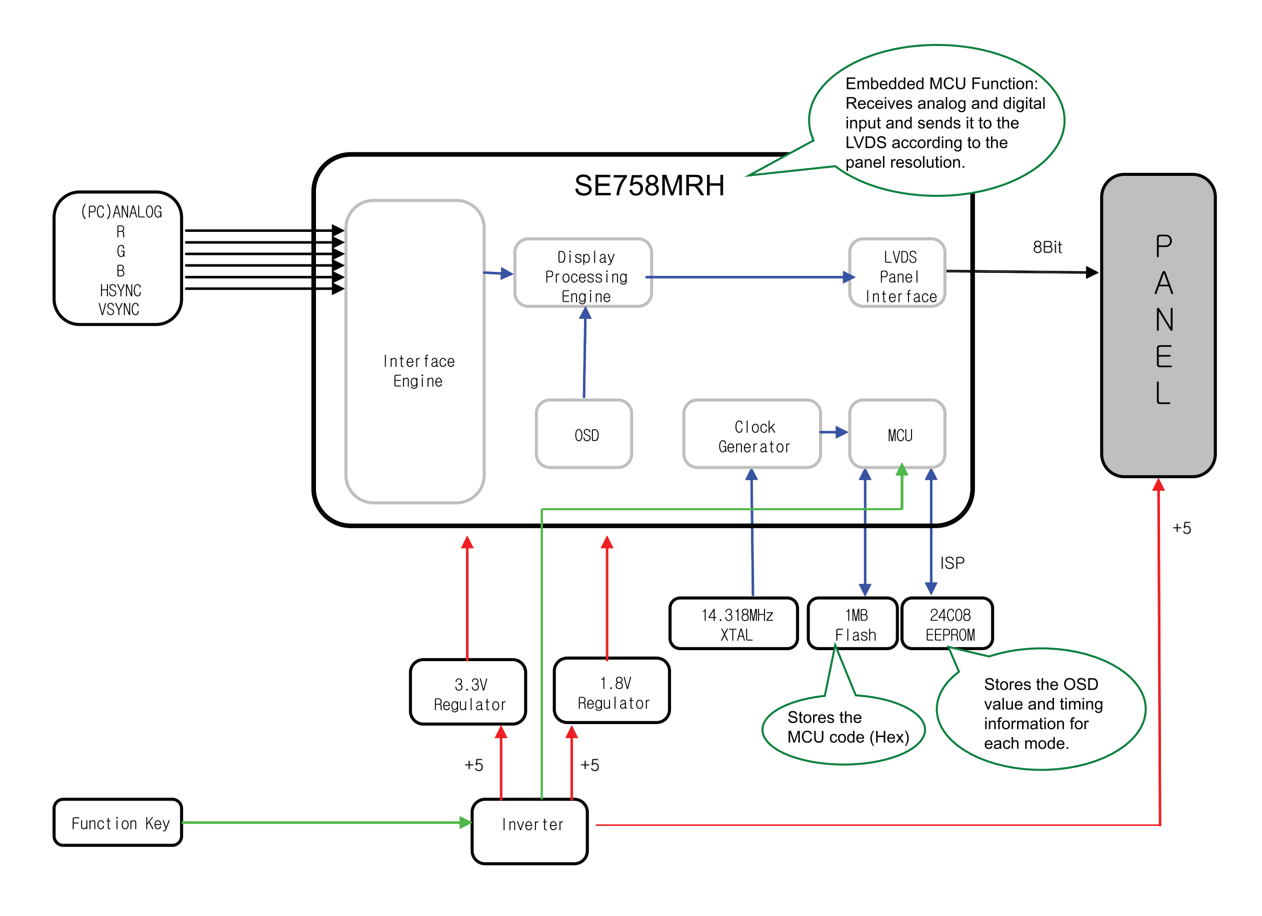
7. Schematic Diagram

7-1. Circuit Descriptions

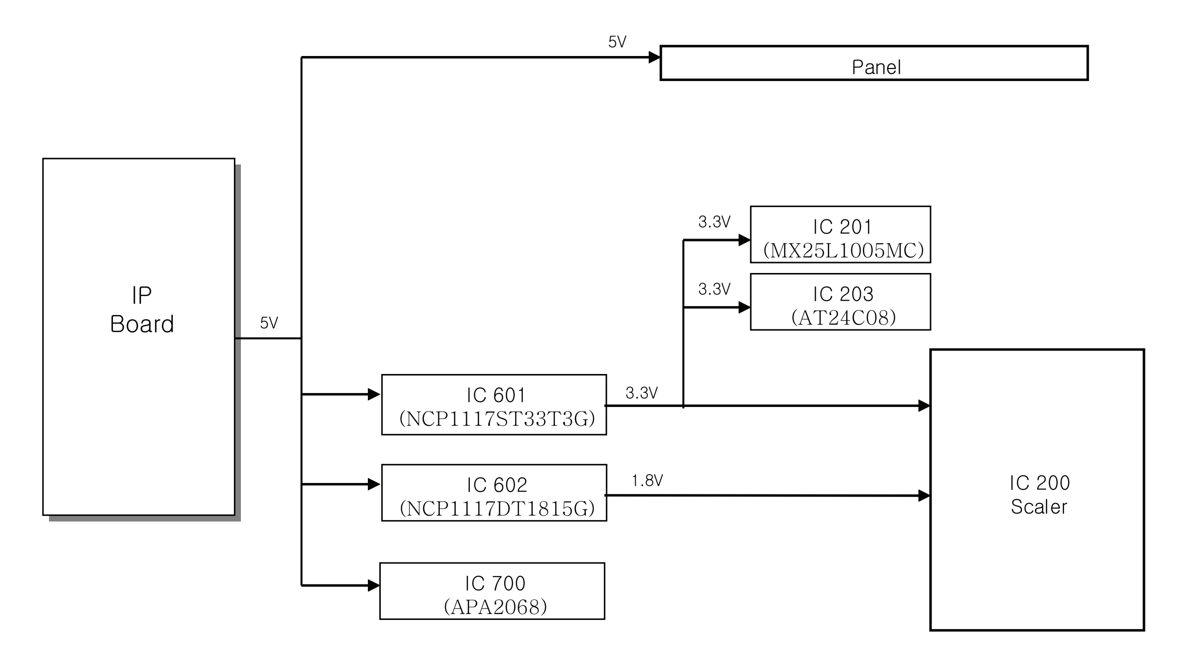


Location	Function	Remark
Scaler IC200	Besides the ADC, LVDS, and scaling part, an MCU is embedded as well. All of them are integrated into one chip.	SE758MRH
Flash Memory IC201	Stores the MCU program embedded in the scaler. It is of a flash type and rewritable.	MX25LV512
IC203	Stores the OSD and various timing values.	24C08
IC202	The memory to which DIGITAL DDC data is input	24C02
Regulator	An IC that receives DC voltage inputs. It is used in circuits that stabilize the DC voltage.	NCP117DT18T5G APL1117-33VC

7-2. Schematic Diagrams (Scaler Part)

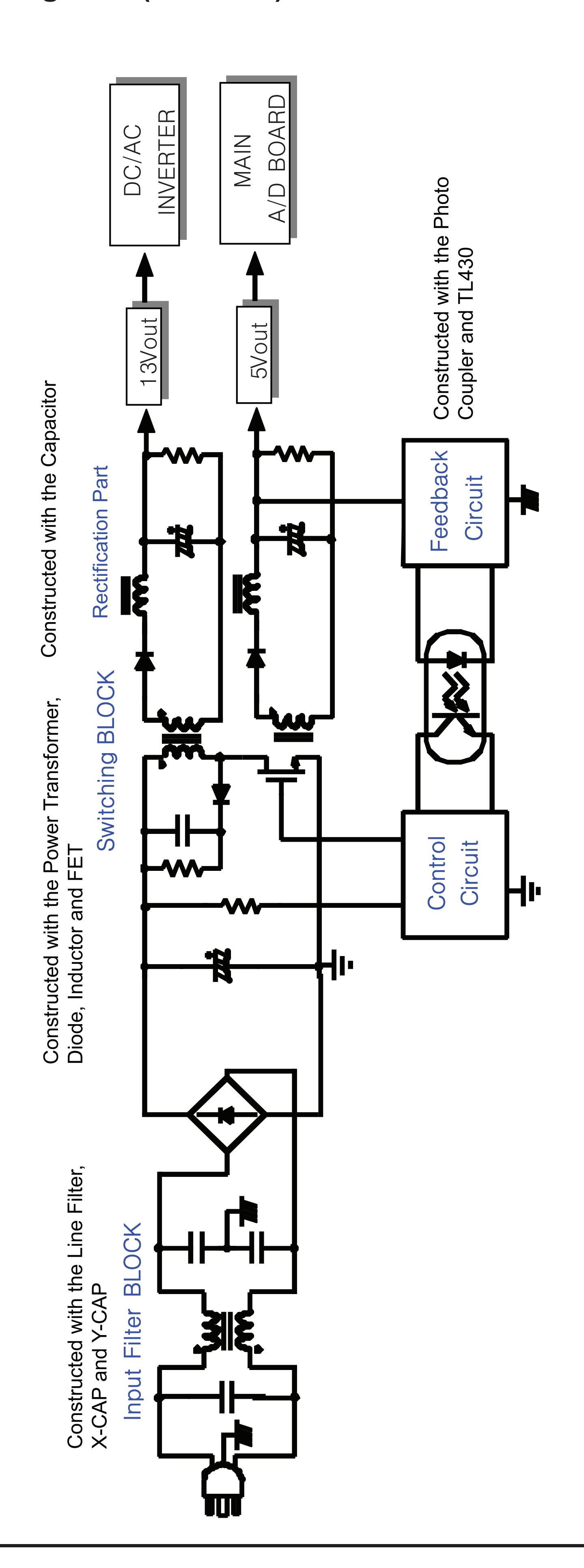


7-3. Schematic Diagrams (Power Flowchart)

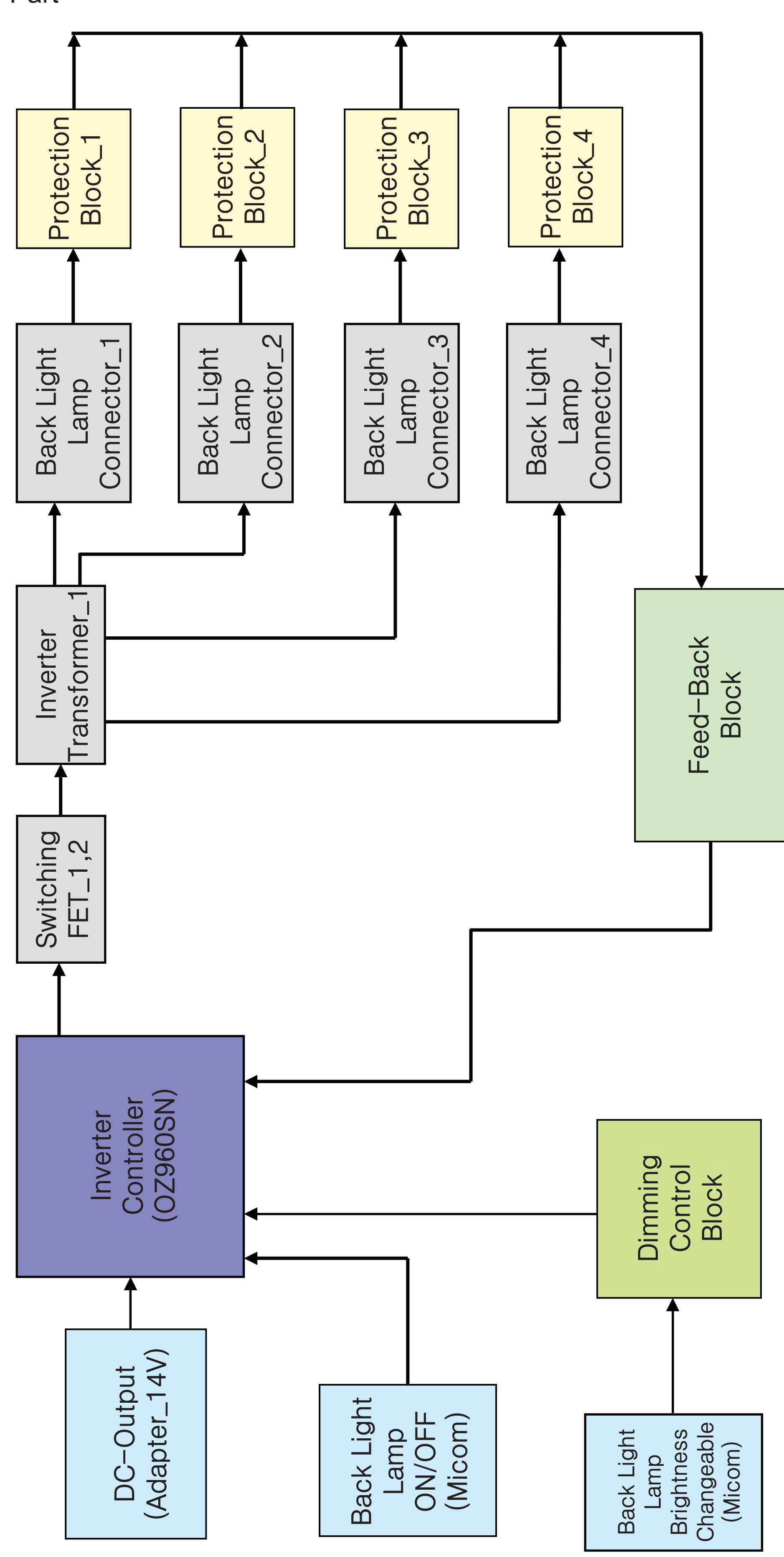


7-4. Schematic Diagrams (IP Board)

■ SMPS Part

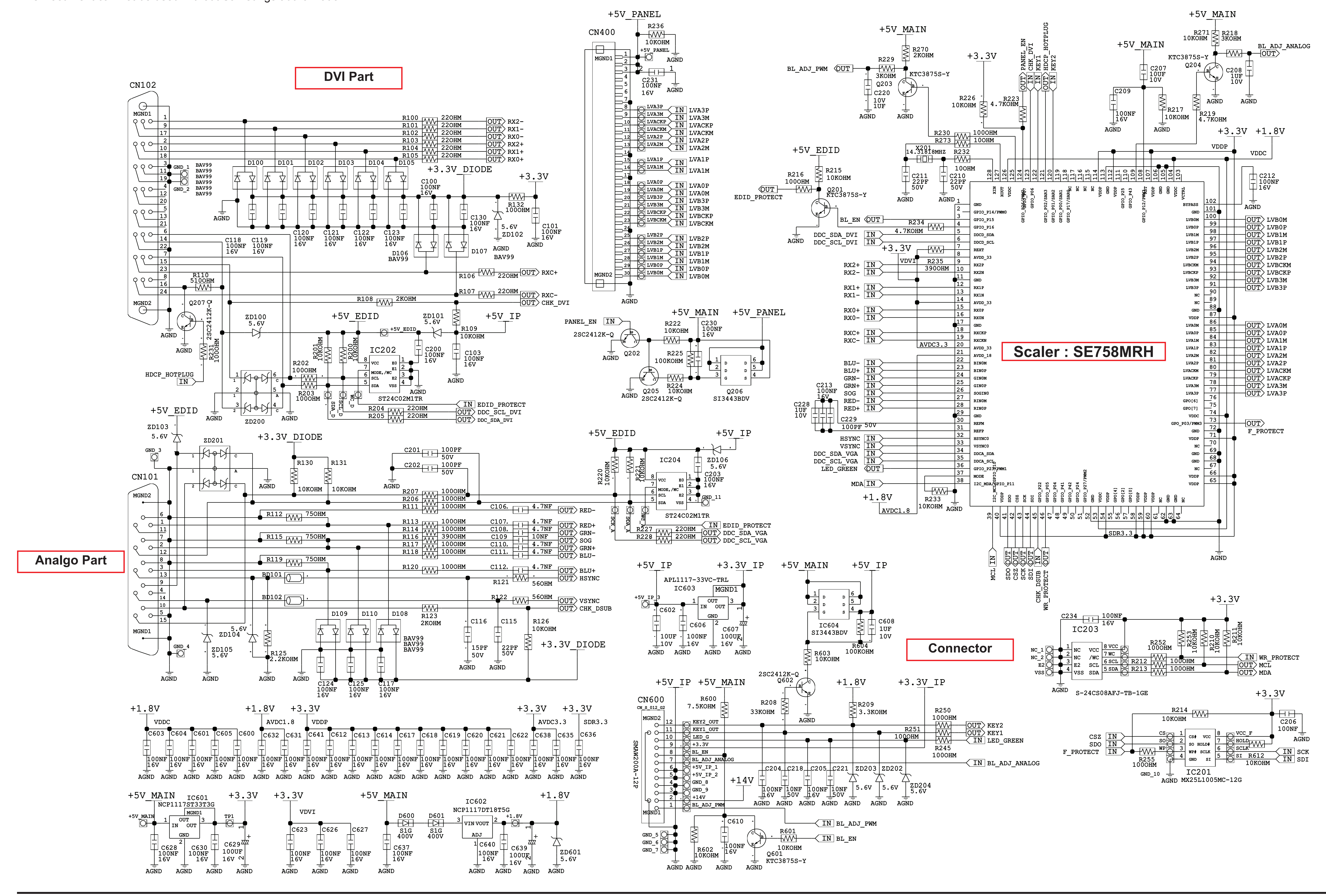


■ Inverter Part



7-5. Schematic Diagrams (Main PBA)

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